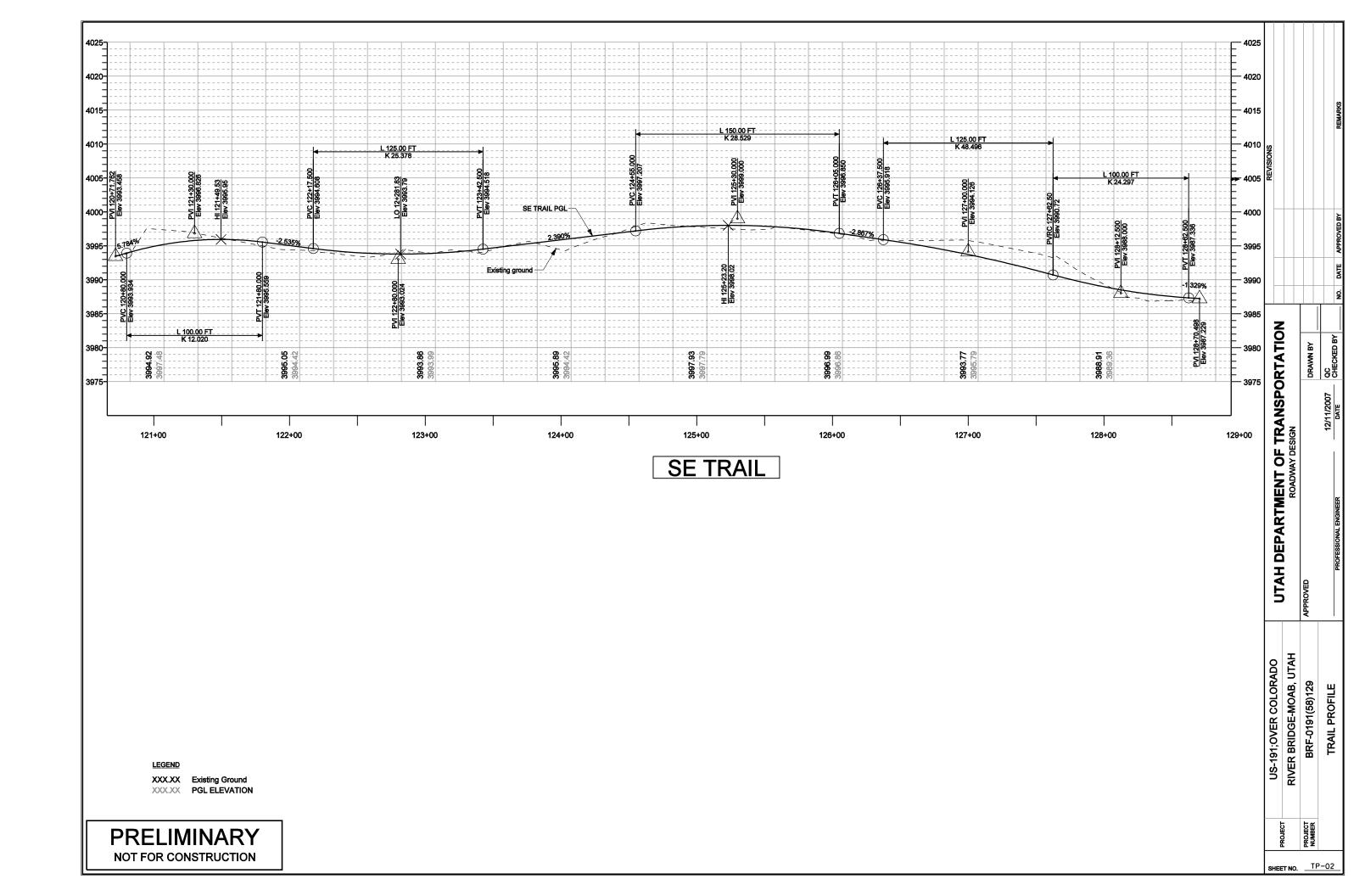
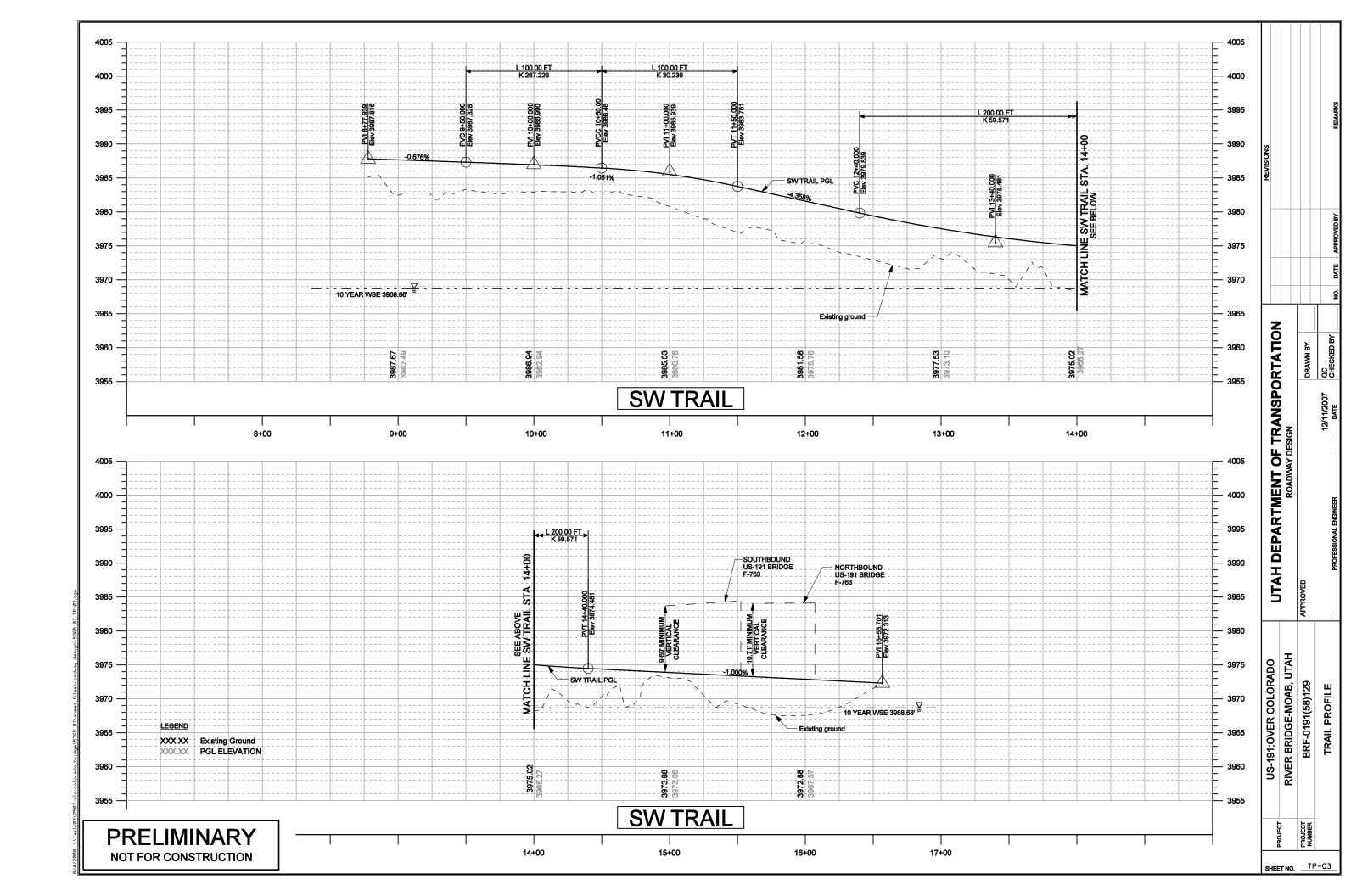
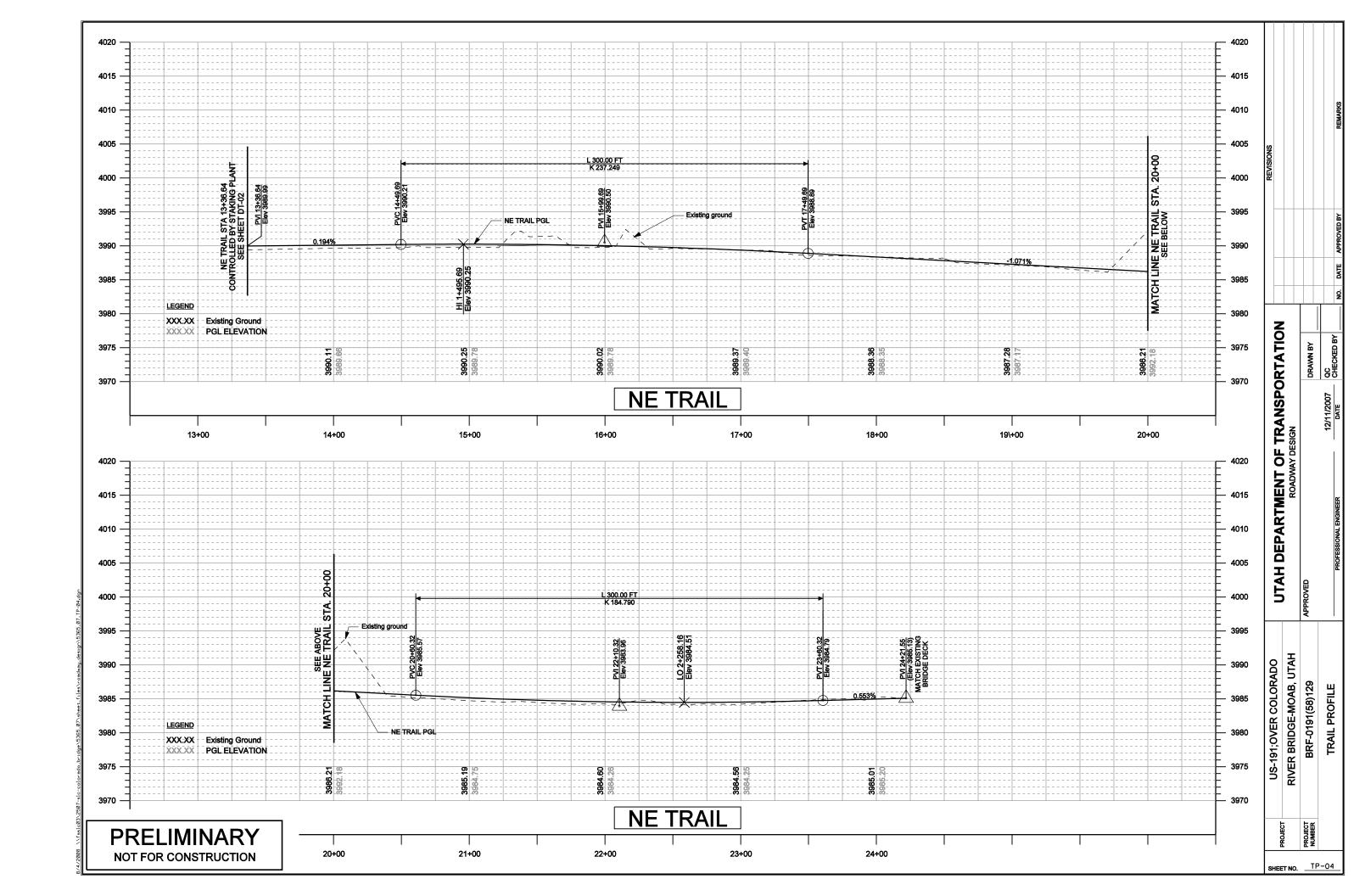
90% PRELIMINARY PLANS

ALL INFORMATION CONTAINED WITHIN
IS TO BE CONSIDERED PRELIMINARY

NOT FOR CONSTRUCTION







UTILITY CONTACTS

Utility Owner	Utility Type	Contact Person	Address	Email Address	Phone	
Enterprise Products Operating	TGas / Oil / Petro		1782 Plateau Cir Moab	tpfnister@eprod.com	435-260-1280	
Frontier	FOC / Telephone	Kim J. Healey/Bill	· ·	bhull@czn.com	435-257-8125	
Communications	Î	Hull	Tremonton, UT 74337		.55 257 0126	
Moab City	SD / SWR / WTR	Brent Williams	217 East Center St Moab	brent@moabcity.org	435-259-7485	
Northwest Pipeline	Gas / Oil / Petro	Scott Patterson	PO Box 58900 SLC	scott.c.patterson@williams.com	801-550-5047	
Preciscom	CATV	Shane Baggs	1750 South Hwy 10,	sbaggs@preciscom.com	435-820-4155	
Cablevision			Price, UT 84501			
Questor	Gas	Kyle Secretan	1140 West 200 South PO	kyle.secretan@questar.com	801-324-3970	
Questar	Gas	Kyle Secretaii	Box 45360 SLC	kyro.soorotan@qaostar.som	001-324-39/0	
Rocky Mountain	Electric	Come Loveler	320 North 100 West	g lawley@pacificorp.com	435-259-3210	
Power	Electric	Gary Lawley	Moab, UT 84532	g.lawley@pacificorp.com		

UTILITY LEGEND)
Existing Fiber Optic	— fo —
Existing Telephone Buried	—btel—
Existing Gas	— g —
Existing Overhead Power	— е —
Existing Sewer	swr
Existing Storm Drain	— sd —
Existing Under Drain	— ud —
Existing Water	wtr
Existing Irrigation	— ir —

	SYMBOLS LEGEND											
	GAS METER	\leftarrow	GUY ANCHOR	(M)	MANHOLE WATER							
X	DROP INLET	O—∳-	LIGHT POLE		WATER METER							
(650)	STORM DRAIN MANHOLE	(PP	POWER POLE	DWI	WATER VALVE							
(uss)	SAN. SEWER MANHOLE	•	POWER TRANSFORMER	•	FIRE HYDRANT							
(MT)	TELEPHONE MANHOLE		JUNCTION BOX	\otimes	POTHOLE LOCATION							
	TELEPHONE PEDESTAL		SIGNAL CONTROLLER	•								
		\otimes	SIGNAL POLE									

QUALITY LEVEL DISCLAIMER

All lines that are labeled as QL-D were derived from maps that were acquired from utility companies. All QL-D labeled lines are noted with such label and are estimated as to their exact location and should be considered as such. All lines that are labeled as QL-C were derived from point to point surface features and are a direct line shot between those features. For exact locations of all subsurface lines test holes should be performed to acquire that data. Depths shown on test holes are only accurate at that location.

PREL IMINARY
NOT FOR CONSTRUCTION

/fsslc03\2507-SLC-Colorado_Bridge\5365_07\Sheet_Files\Utilities\5365_07

SHEET NO. UT-00

US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH BRF-0191(58)129

UTILITY CONTACT SHEET

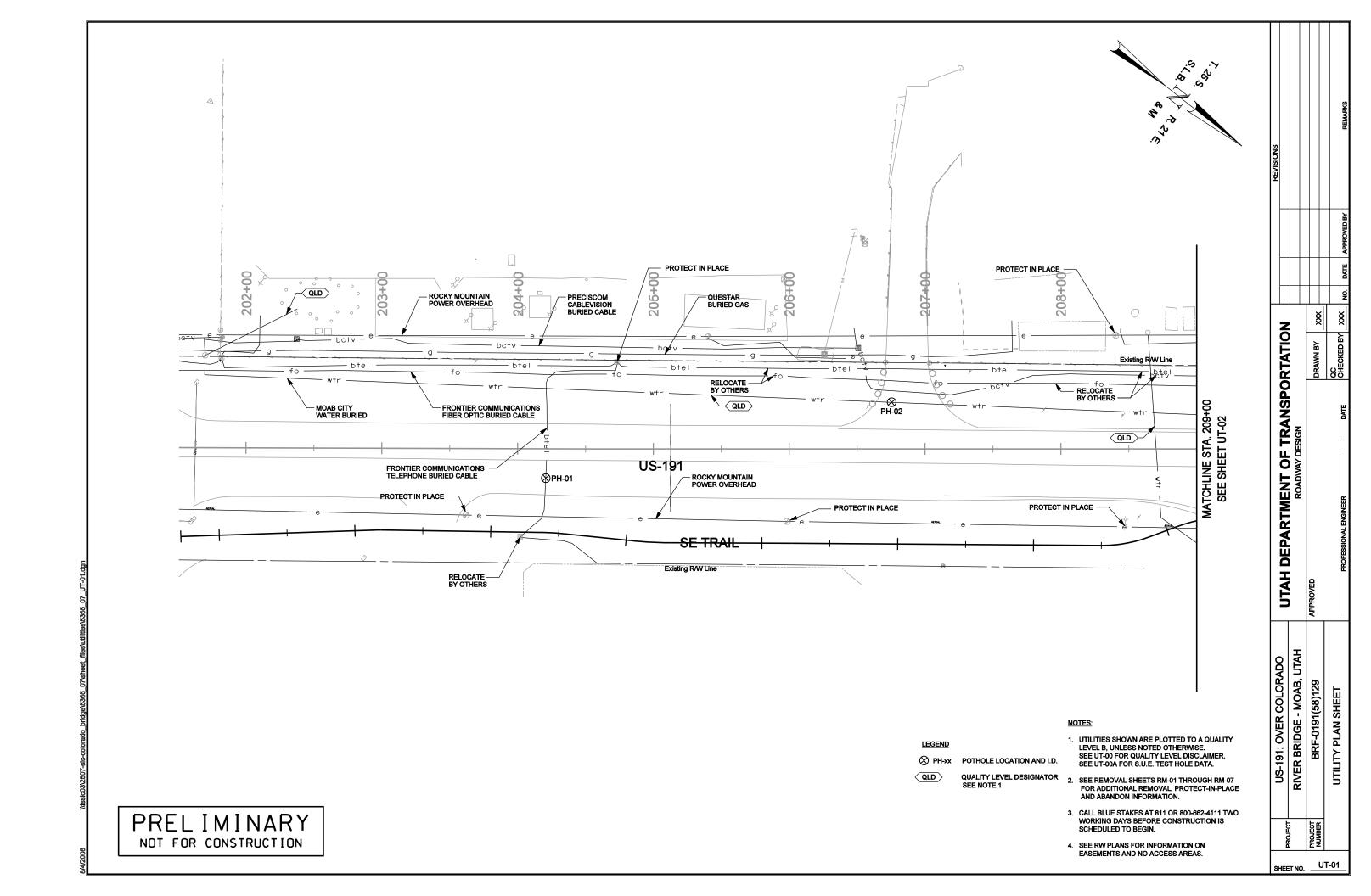
UTAH DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN

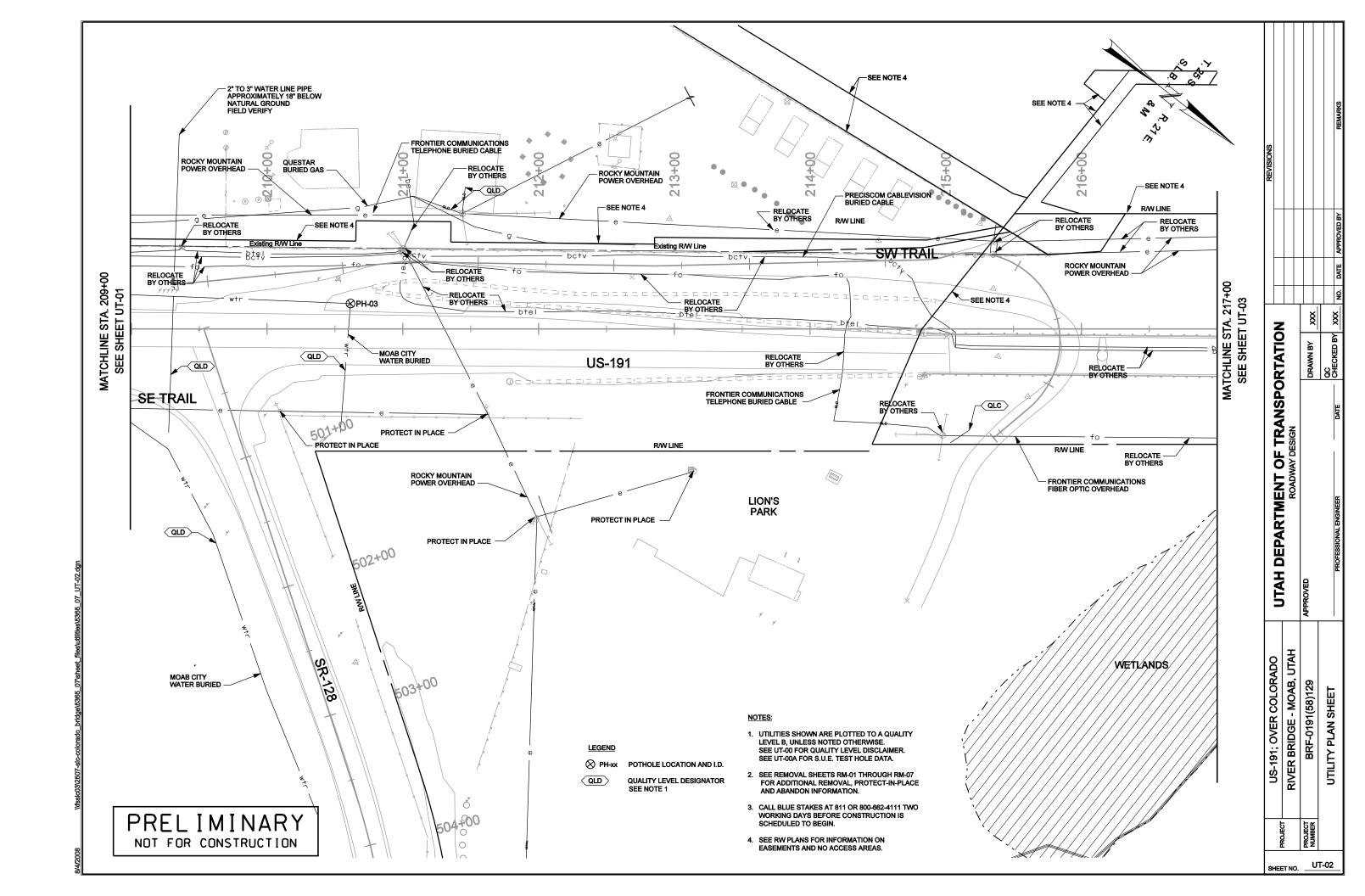
DRAWN BY QC CHECKED BY

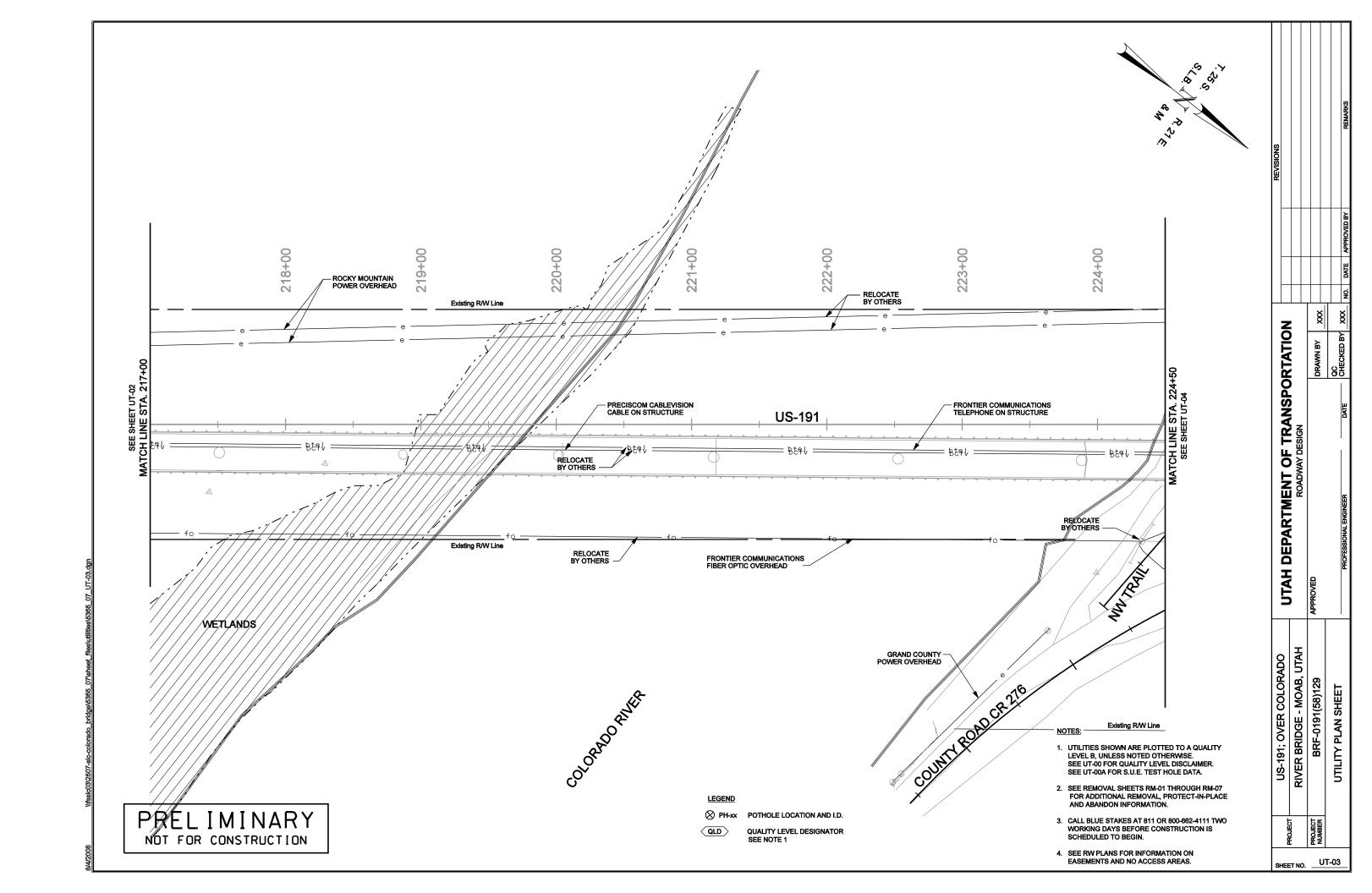
	S.U.E. TEST HOLE DATA																
Test Hole Number	Location	Date	Type of Utility	Utility Size	Material of Utility	Cross Section	Utility Owner	Point ID Number	Northing	Easting	Existing Ground Elevation	Field Depth	Elevation (Top of Utility)	Surface Type Ground/Paving/Co ncrete	Surface Thickness	Depth of Water	General Soil Type
1	US 191	2/14/2008	Phone	3"	PVC		Frontier Communications	TBE 1	199718.525	100114.153	3991.90	6.51	3985.39	ASPHALT	6"	N/A	SANDY
2	CANCELLED PER CLIENT																
3	CANCELLED PER CLIENT																
4	DUG ON TEST HOLE AT 2 LOCATIONS - UNABLE TO LOCATE LINE DUE TO ROCKY TERRAIN																
5	US 191	2/14/2008	Phone	1"	DBC		Frontier Communications	TBE 5	201843.341	98214.169	3985.21	3.75	3981.46	NATURAL GROUND	N/A	N/A	ROCKY
6	US 191	2/14/2008	Fiber Optic	2"	PVC		Frontier Communications	TBE 6	201841.776	98213.515	3985.29	3.67	3981.62	NATURAL GROUND	N/A	N/A	ROCKY
7	US 191	2/14/2008	Fiber Optic	(1) .5" (1).25"	DBC		Frontier Communications	TBE 7	201456.967	98633.700	3970.20	3.90	3966.30	NATURAL GROUND	N/A	N/A	SOFT

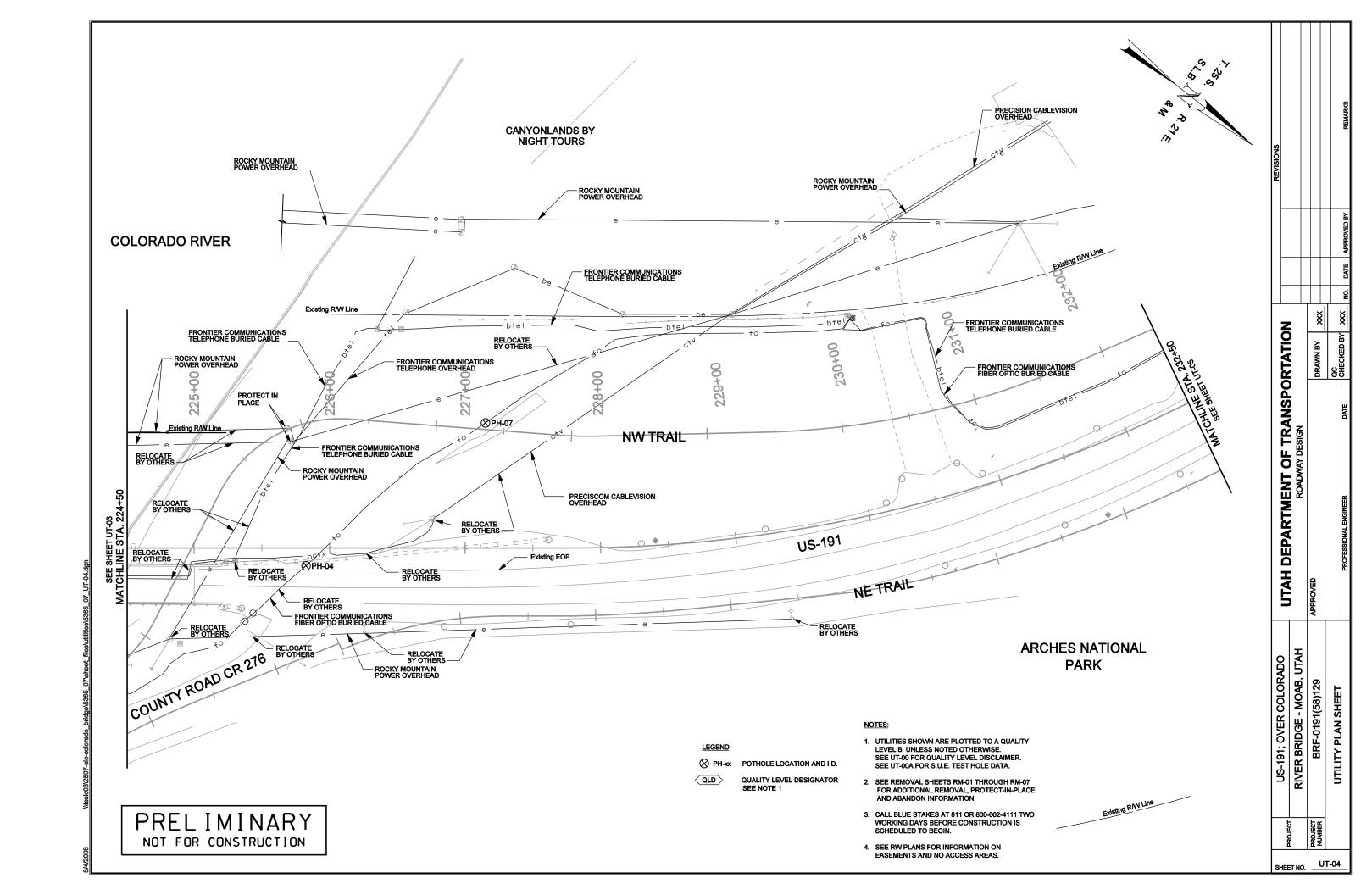
UTAH DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN DRAWN BY QC CHECKED BY APPROVED US-191; OVER COLORADO
RIVER BRIDGE - MOAB, UTAH
BRF-0191(58)129
S.U.E. TEST HOLE DATA SHEET NO. UT-00A

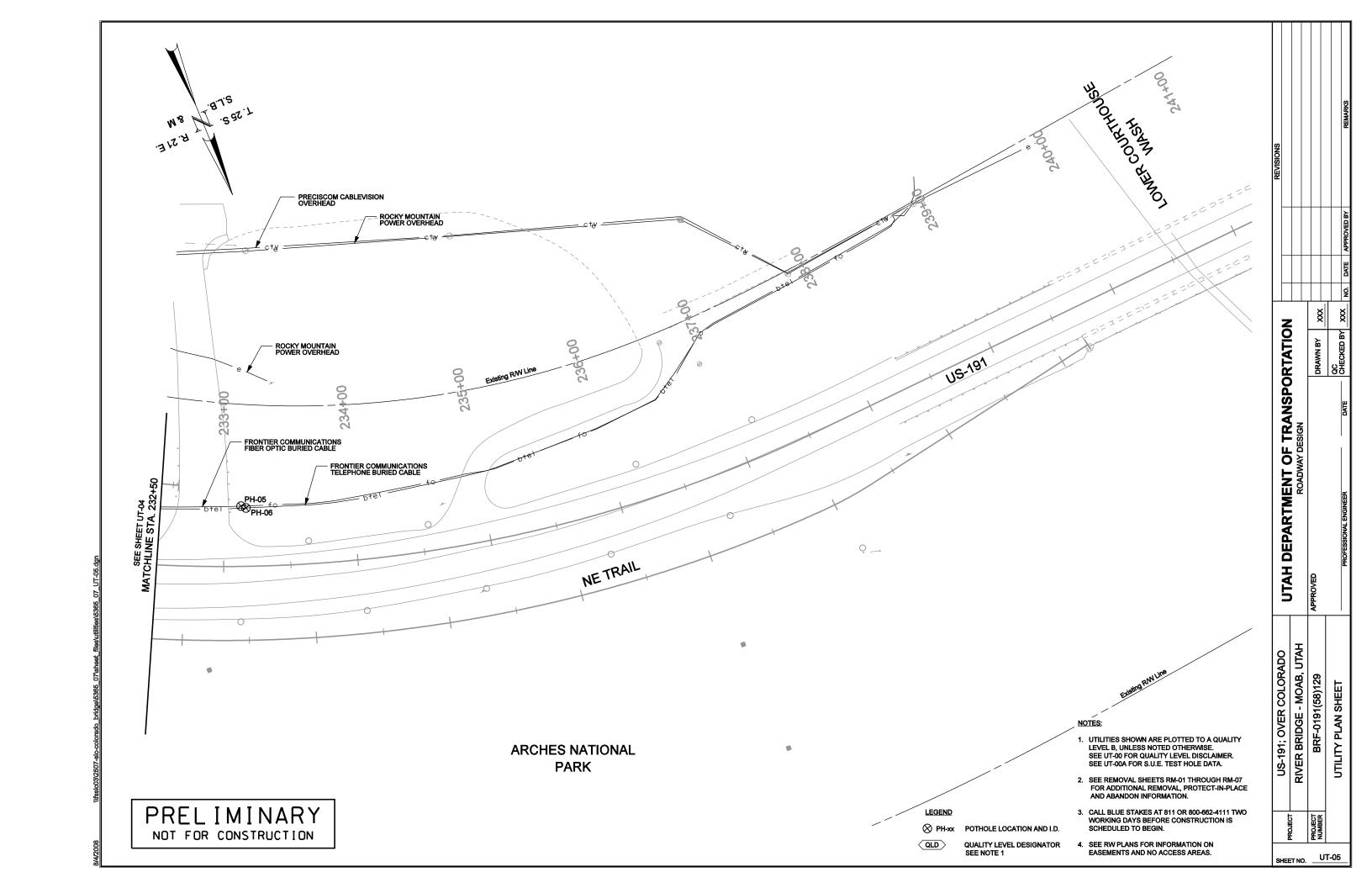
PREL IMINARY
NOT FOR CONSTRUCTION





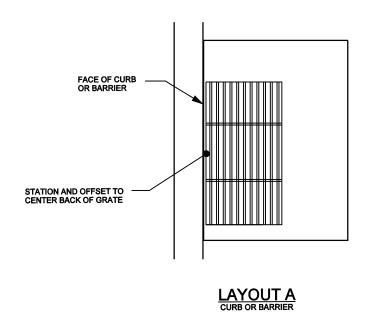


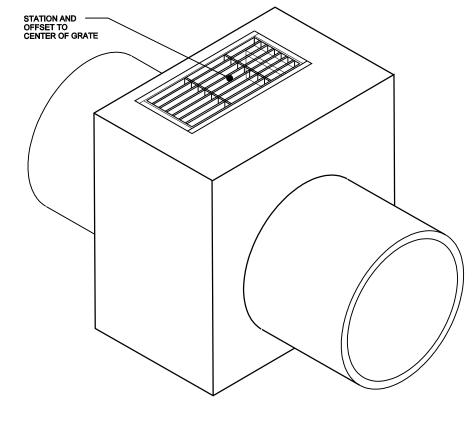




STATION AND OFFSET LOCATION DETAIL

.T.S.





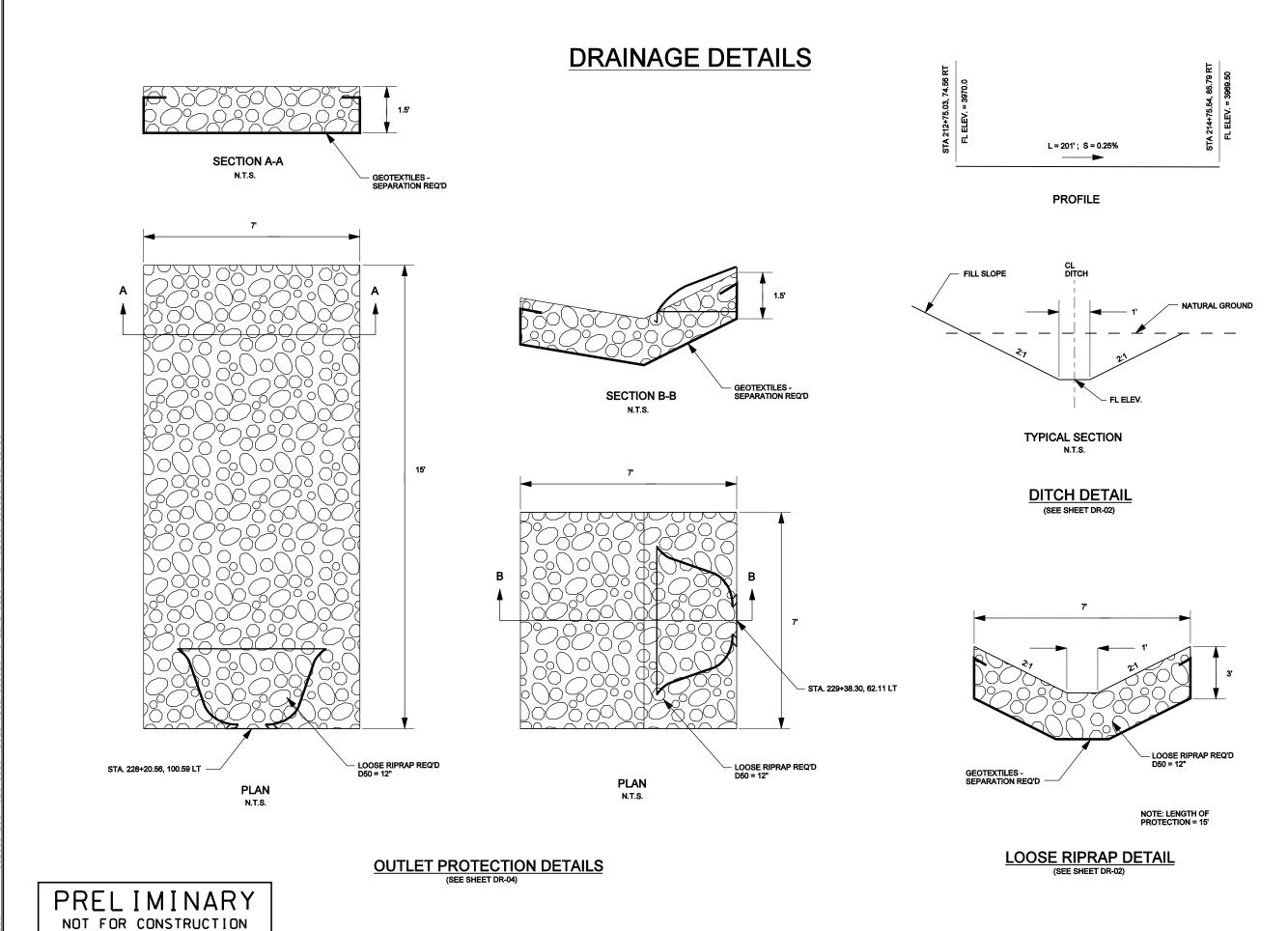
LAYOUT B NO CURB OR BARRIER

GENERAL CATCH BASIN NOTE:
THE STATION AND OFFSET FOR EACH CATCH BASIN
REFERS TO A CONTROL POINT AS FOLLOWS:
- IN CURB AND GUTTER: CENTER OF GRATE LOW SIDE
IN GUTTER FLOW LINE
- IN SWALES, DITCHES OR PAVEMENT WITHOUT CURB
OR BARRIER: CENTER OF THE GRATE
- ALONG BARRIER: CENTER OF GRATE LOW SIDE AT
THE TOE OF THE BARRIER (SEE DETAIL THIS SHEET)

PRELIMINARY
NOT FOR CONSTRUCTION

UTAH DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN DRAWN BY QC CHECKED BY US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH BRF-0191(58)129

4/2008



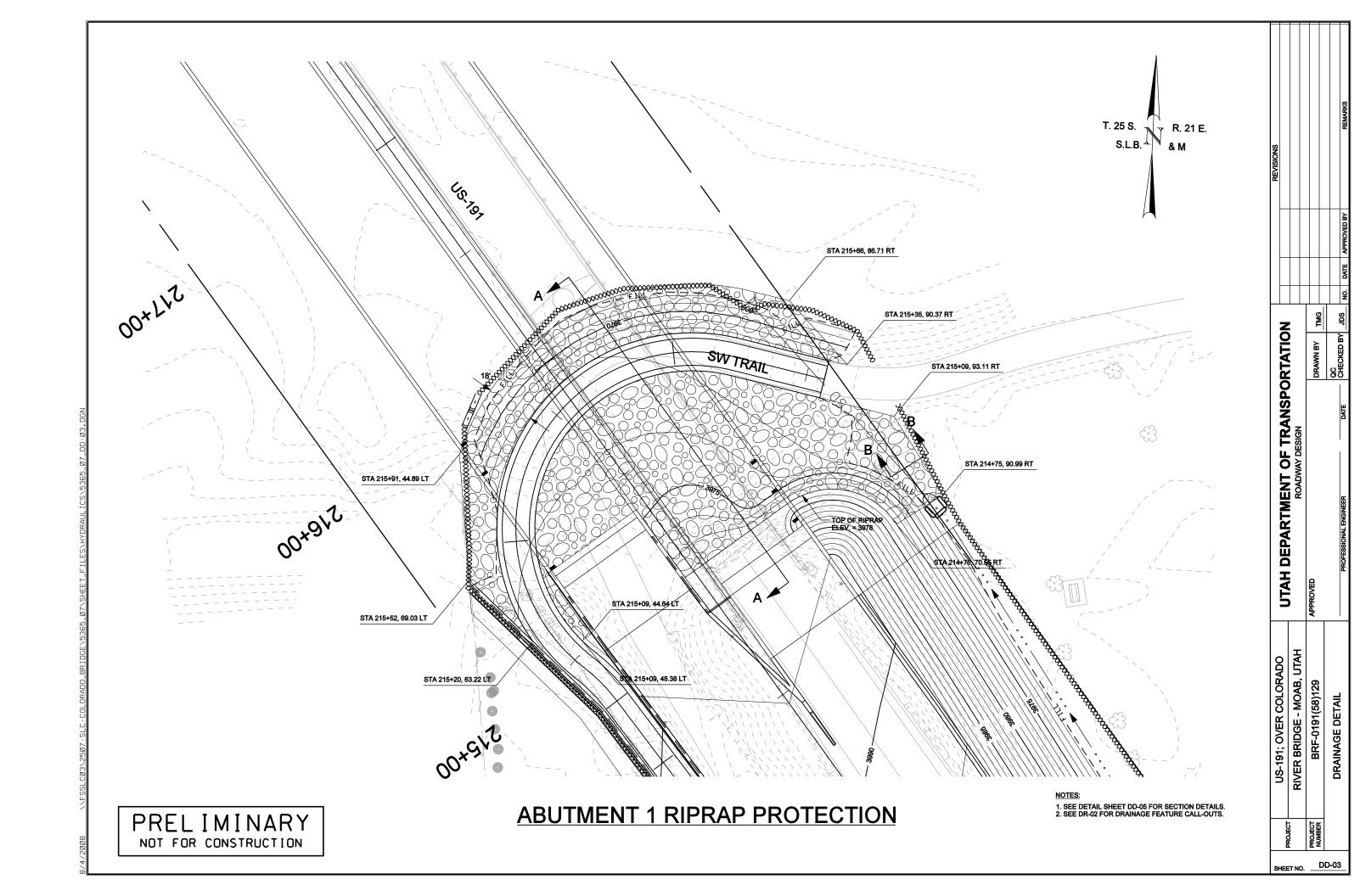
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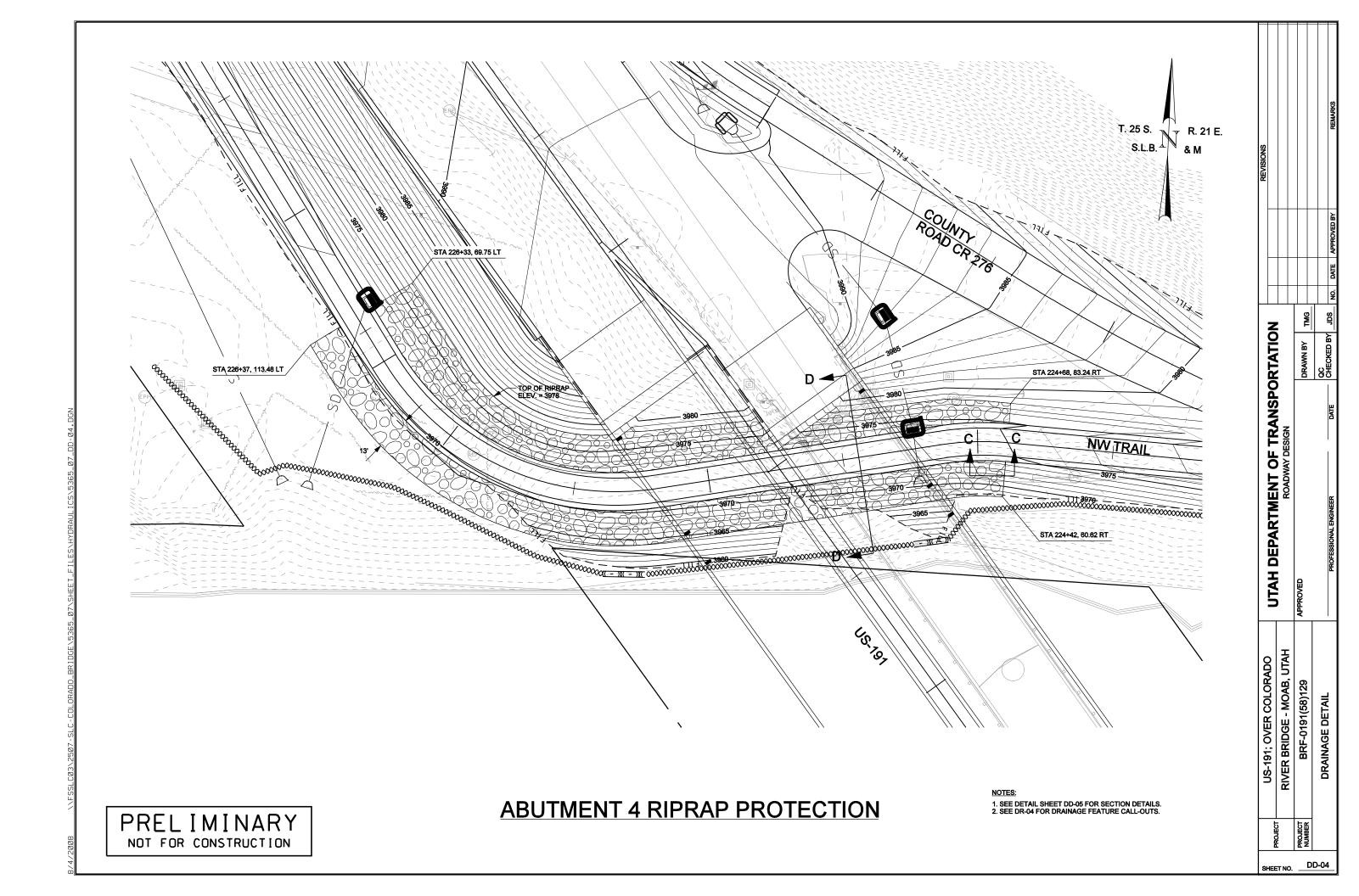
SHEET NO. DD-0

US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH BRF-0191(58)129

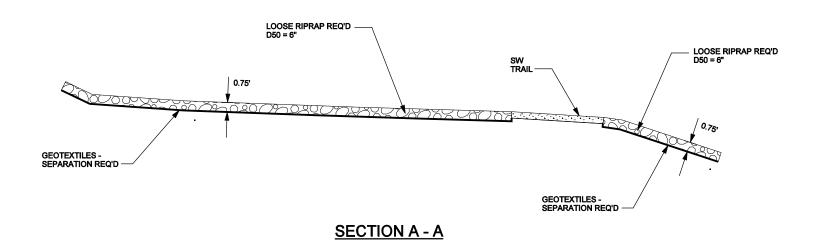
UTAH DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN

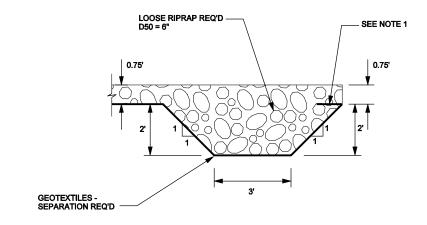
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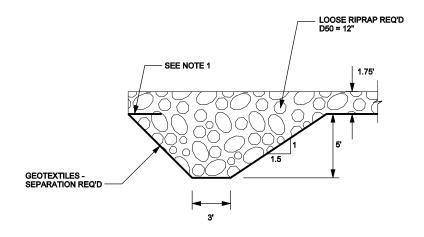


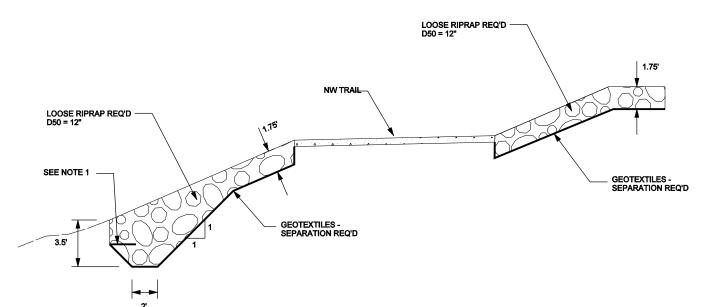
RIPRAP SECTION DETAILS





SECTION B - B
SEE DD-03





SECTION C - C

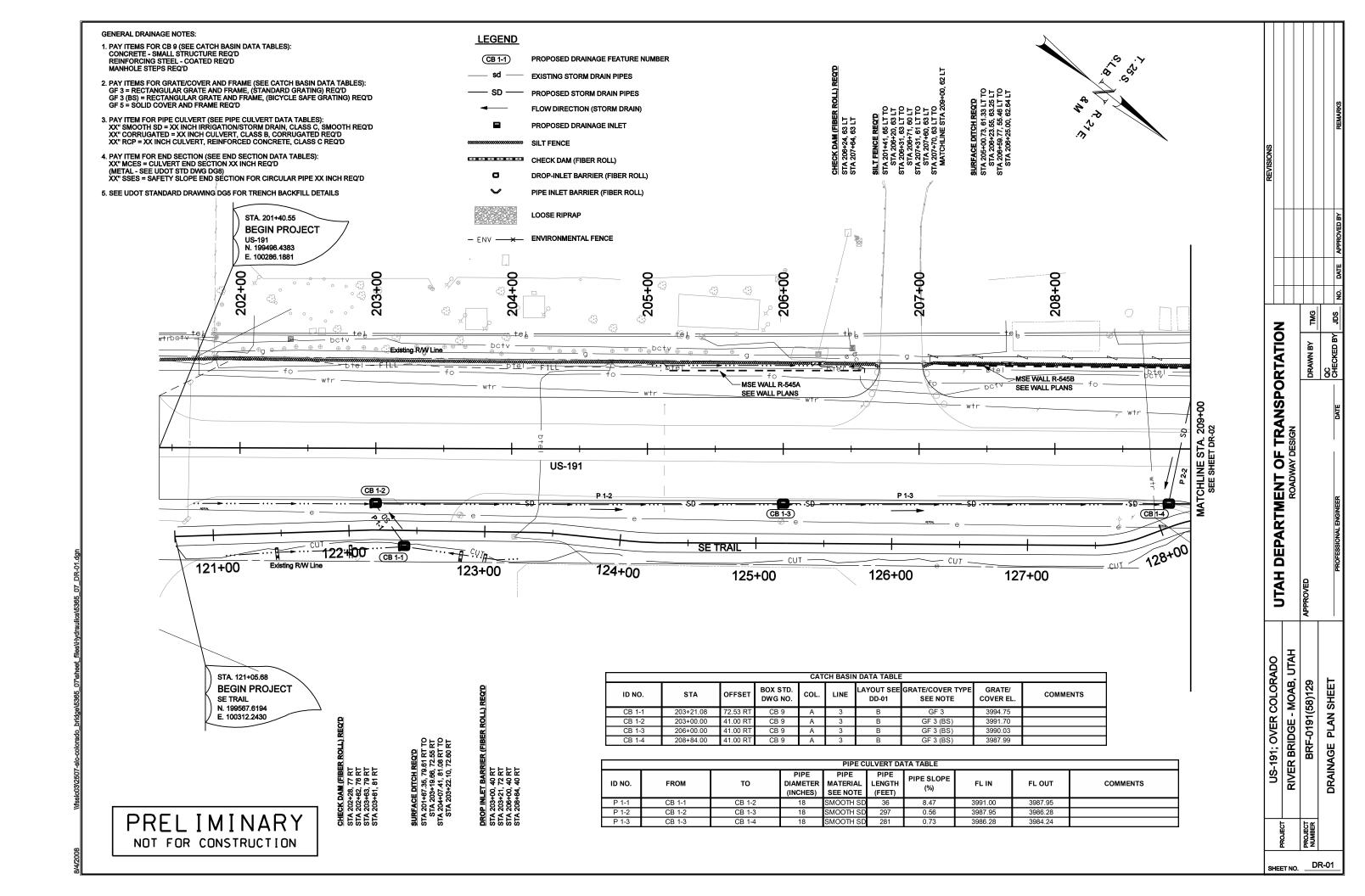
SECTION D - D
SEE DD-04

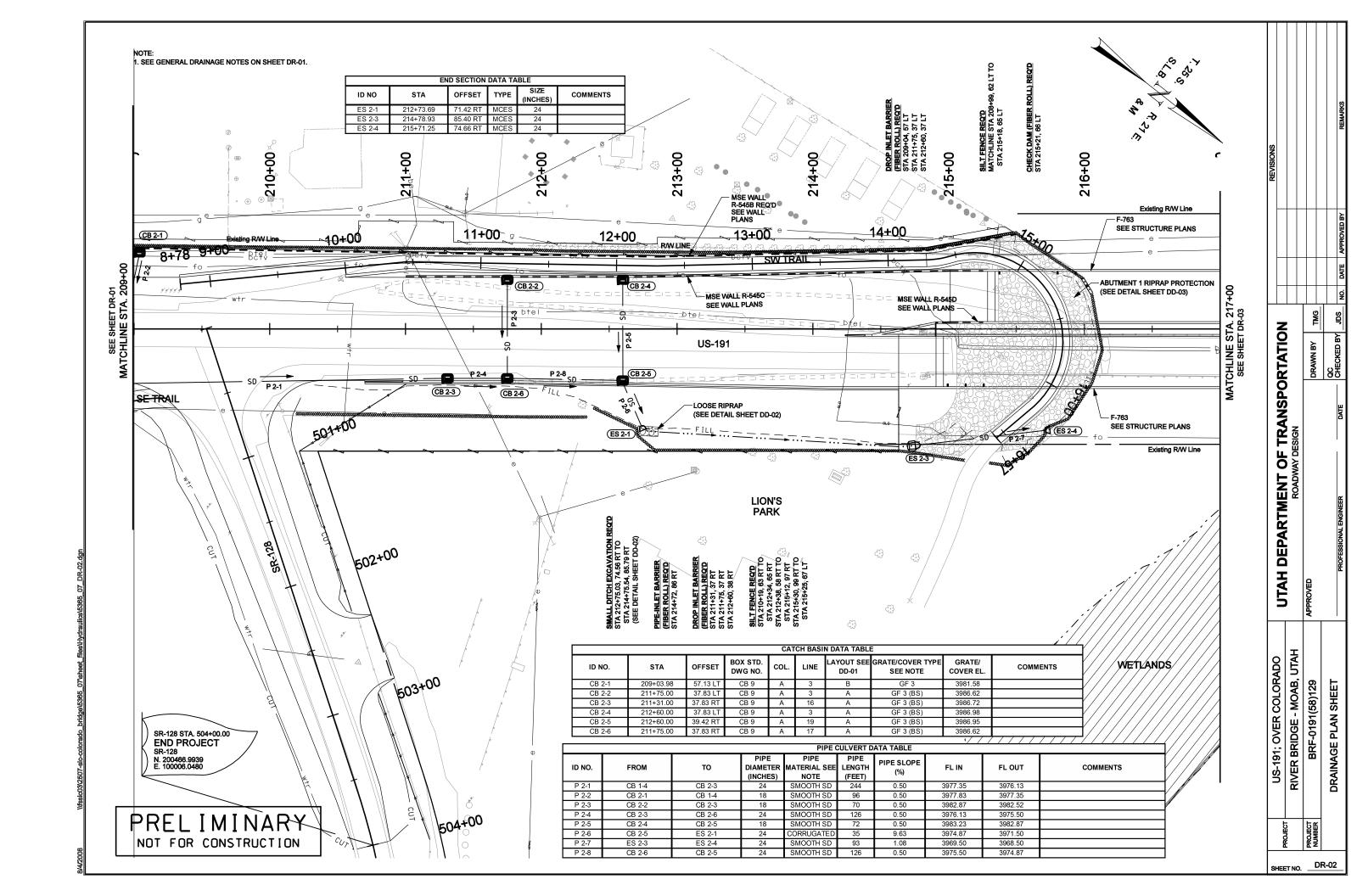
PRELIMINARY
NOT FOR CONSTRUCTION

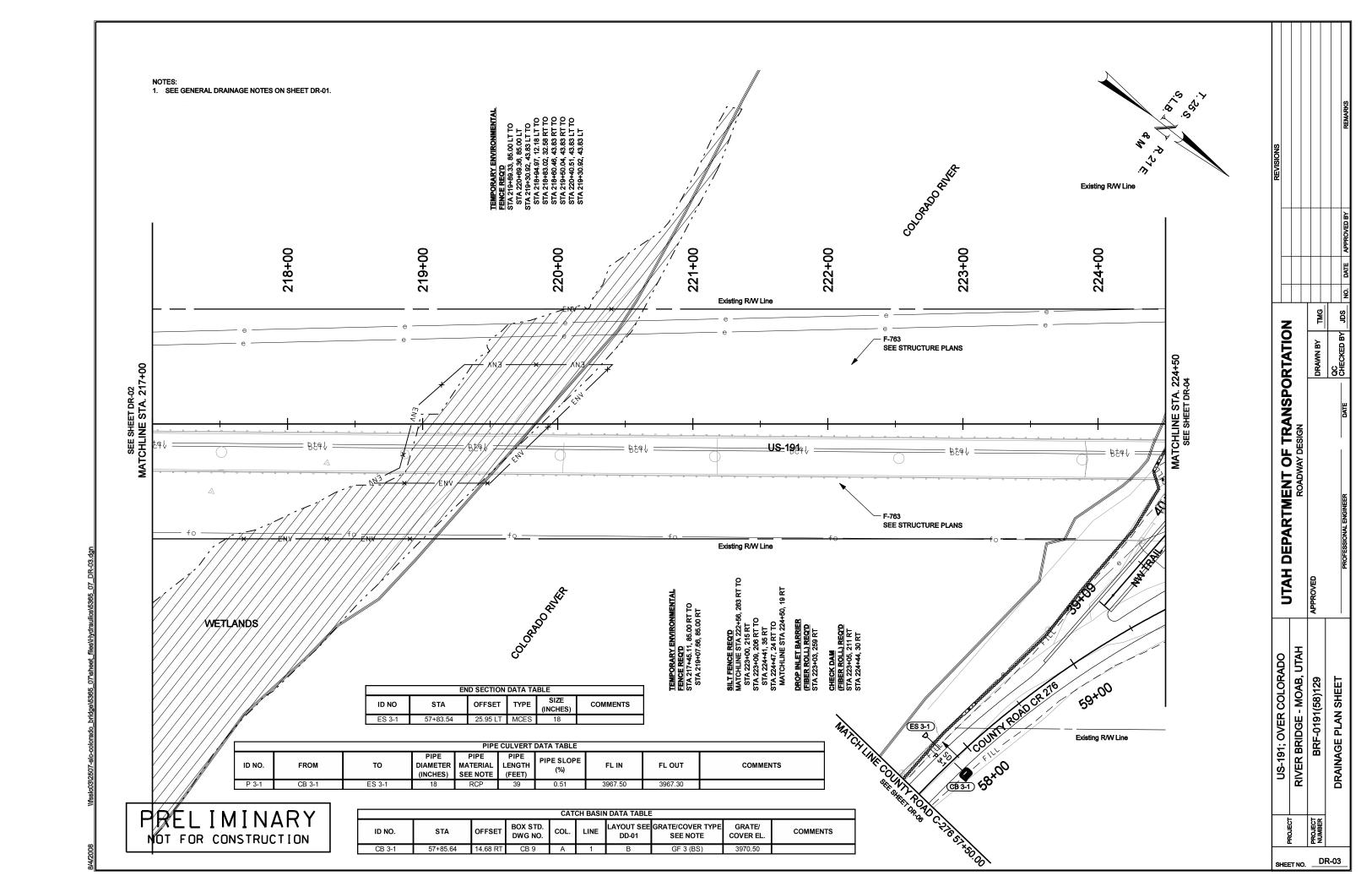
NOTES:

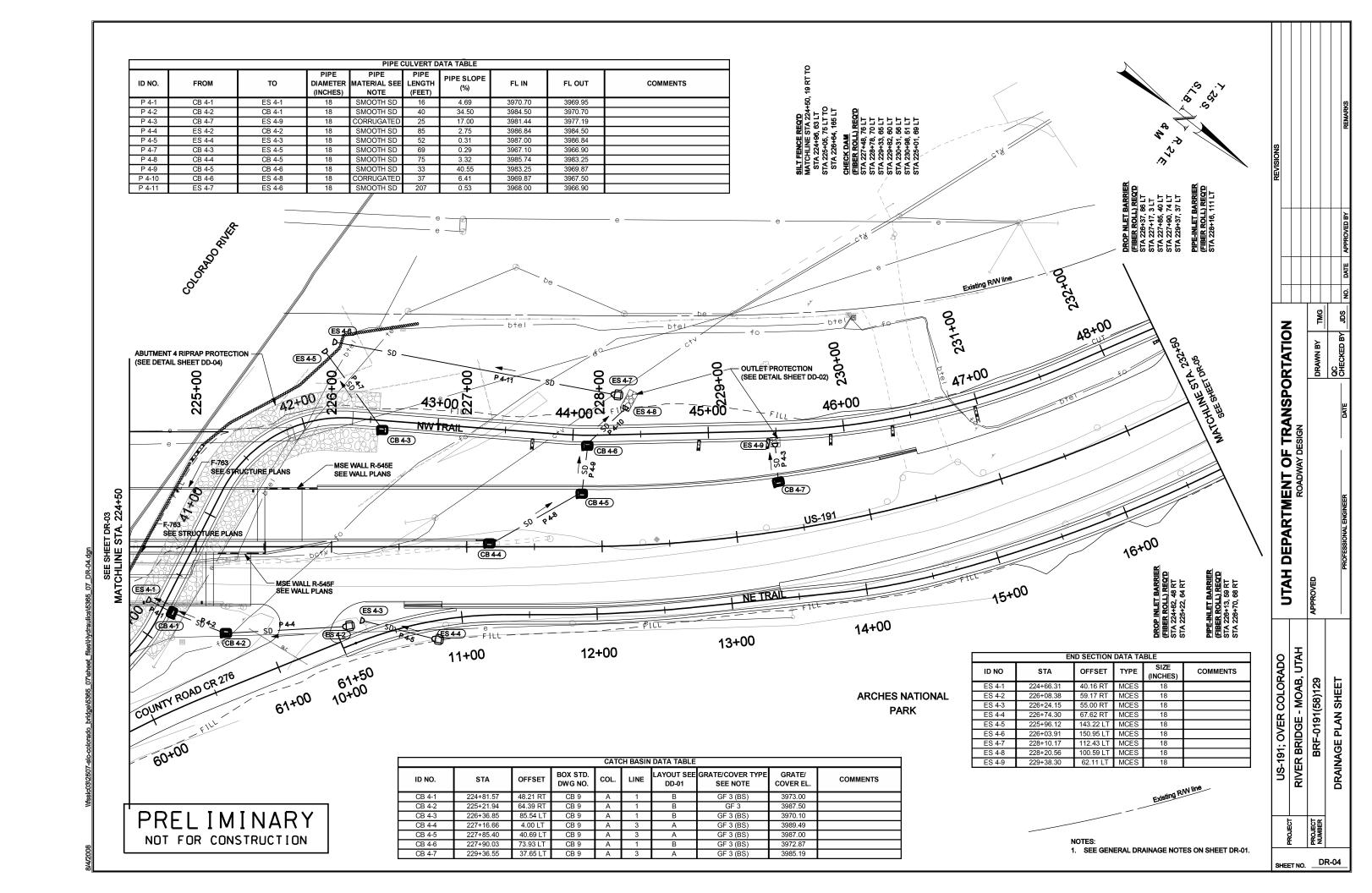
 WRAP GEOTEXTILE BACK INTO RIPRAP 1 FOOT MINIMUM.

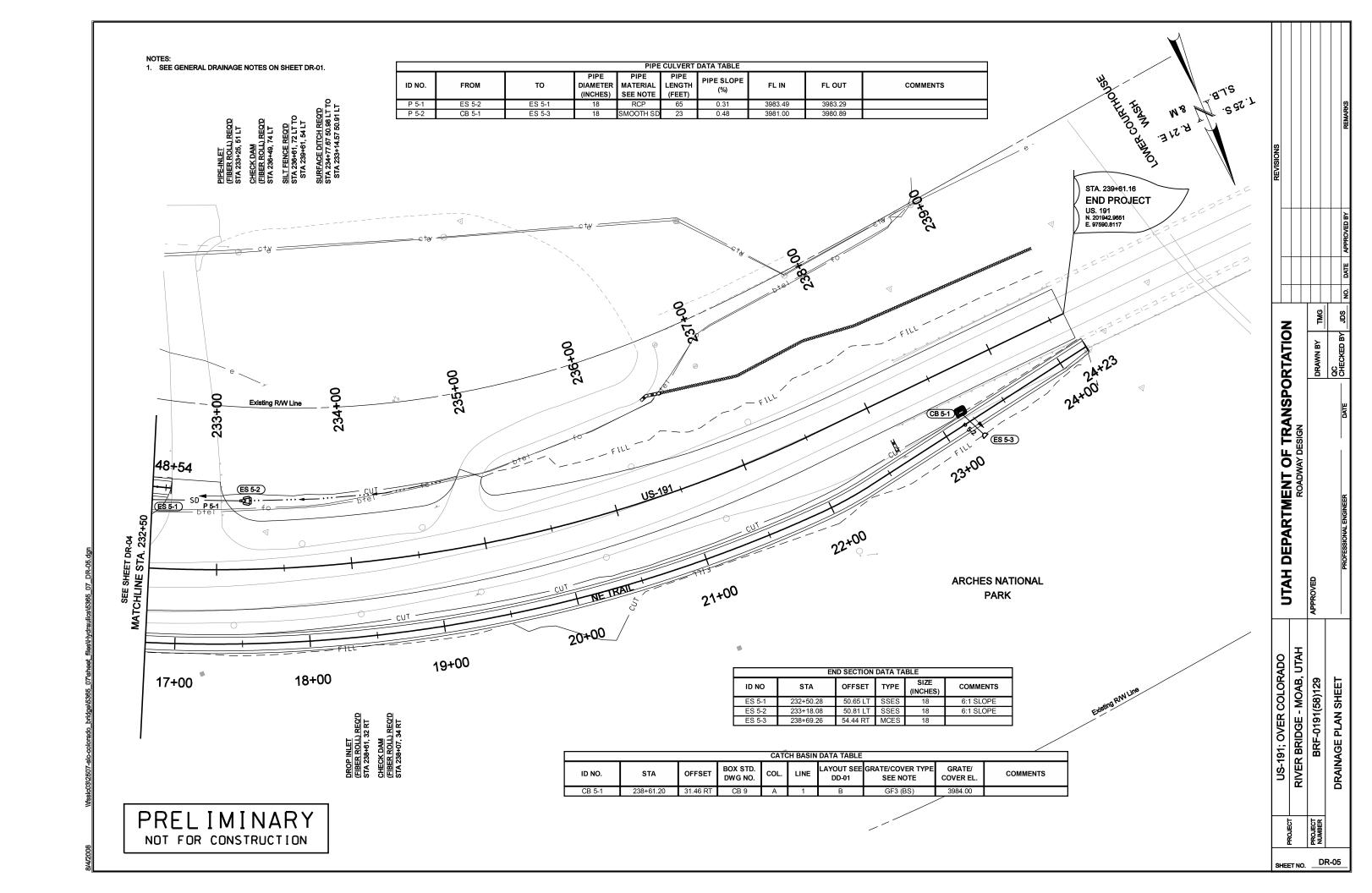
UTAH DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN DRAWN BY QC CHECKED BY US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH BRF-0191(58)129

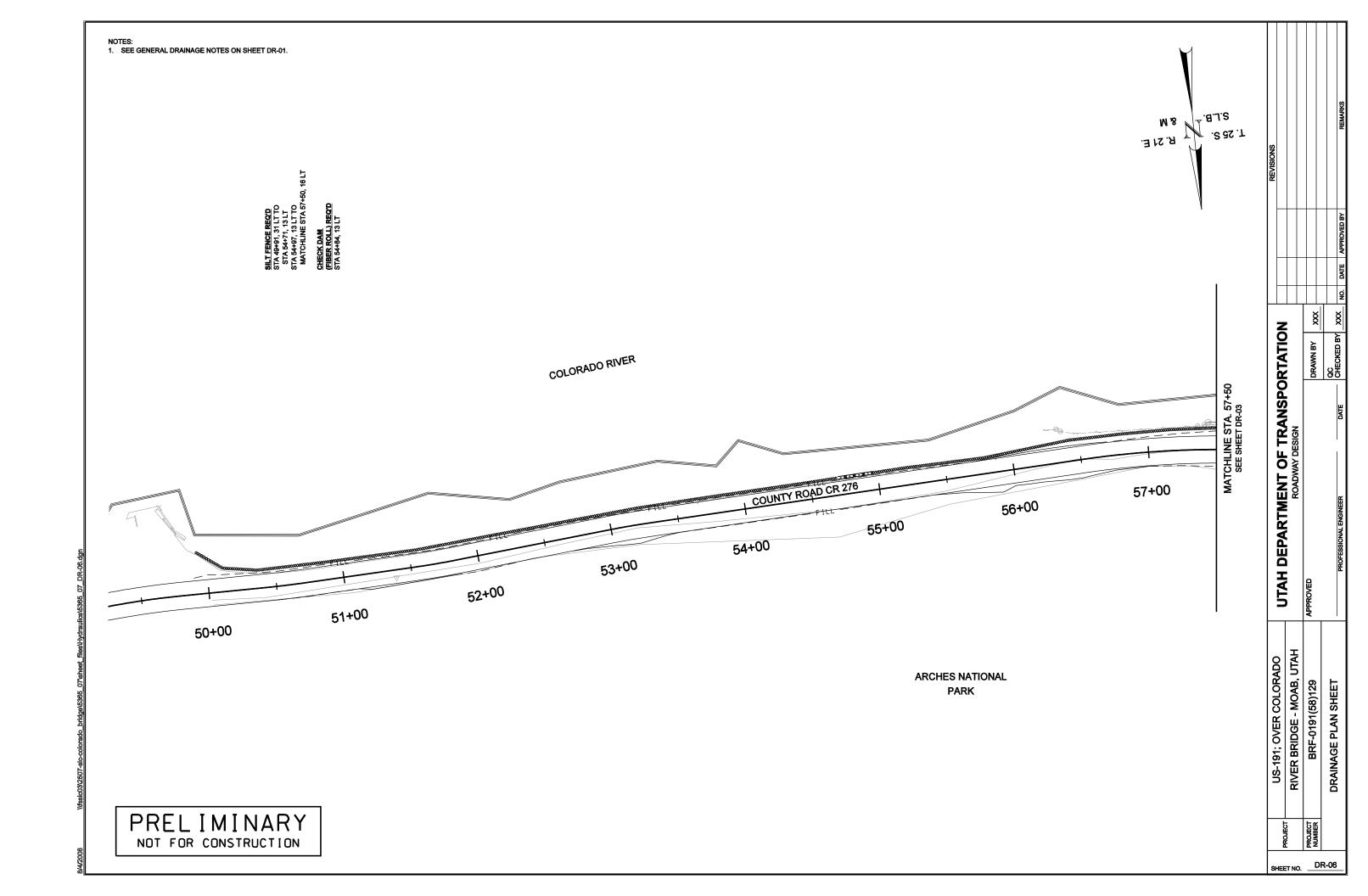


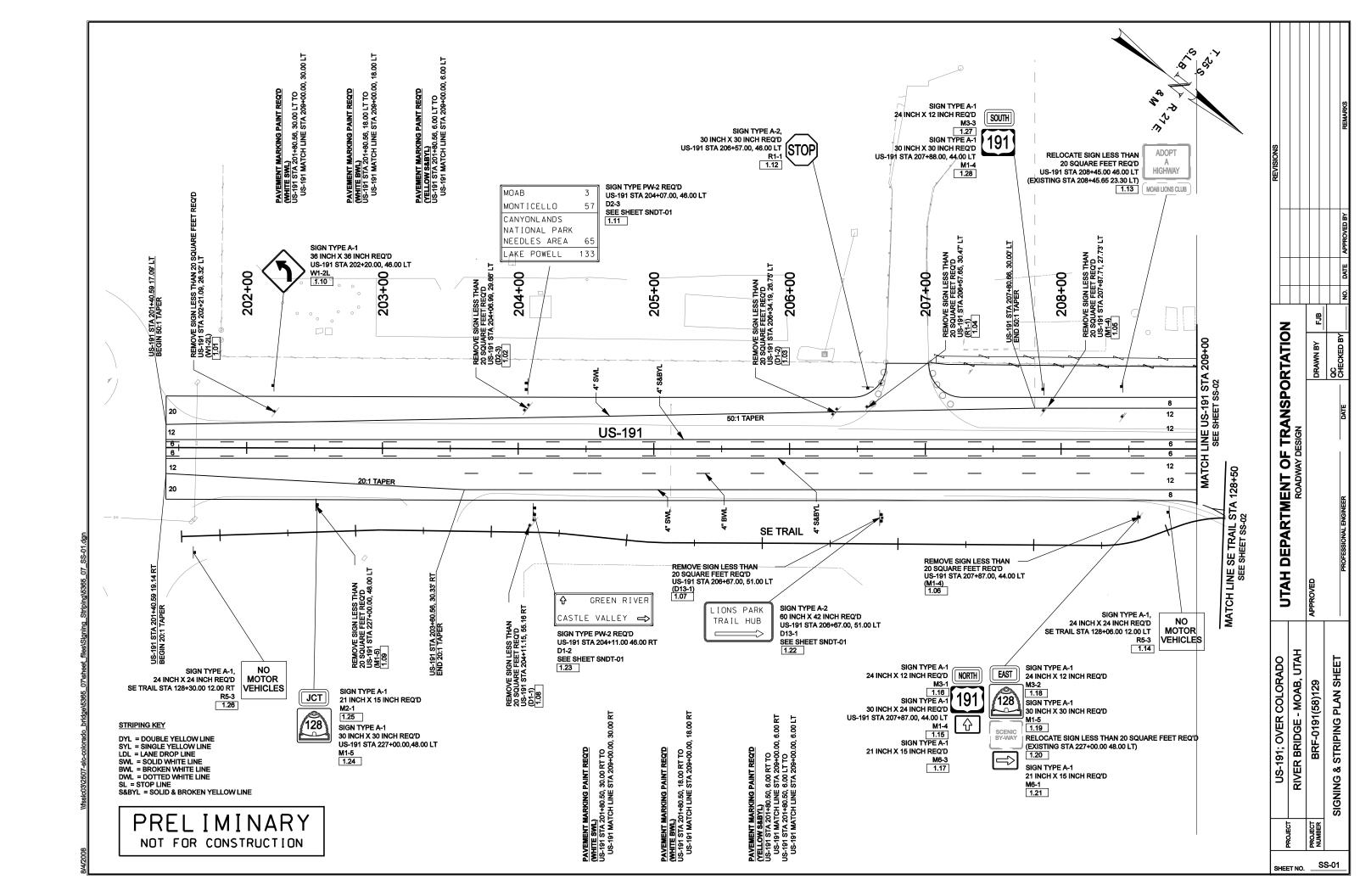


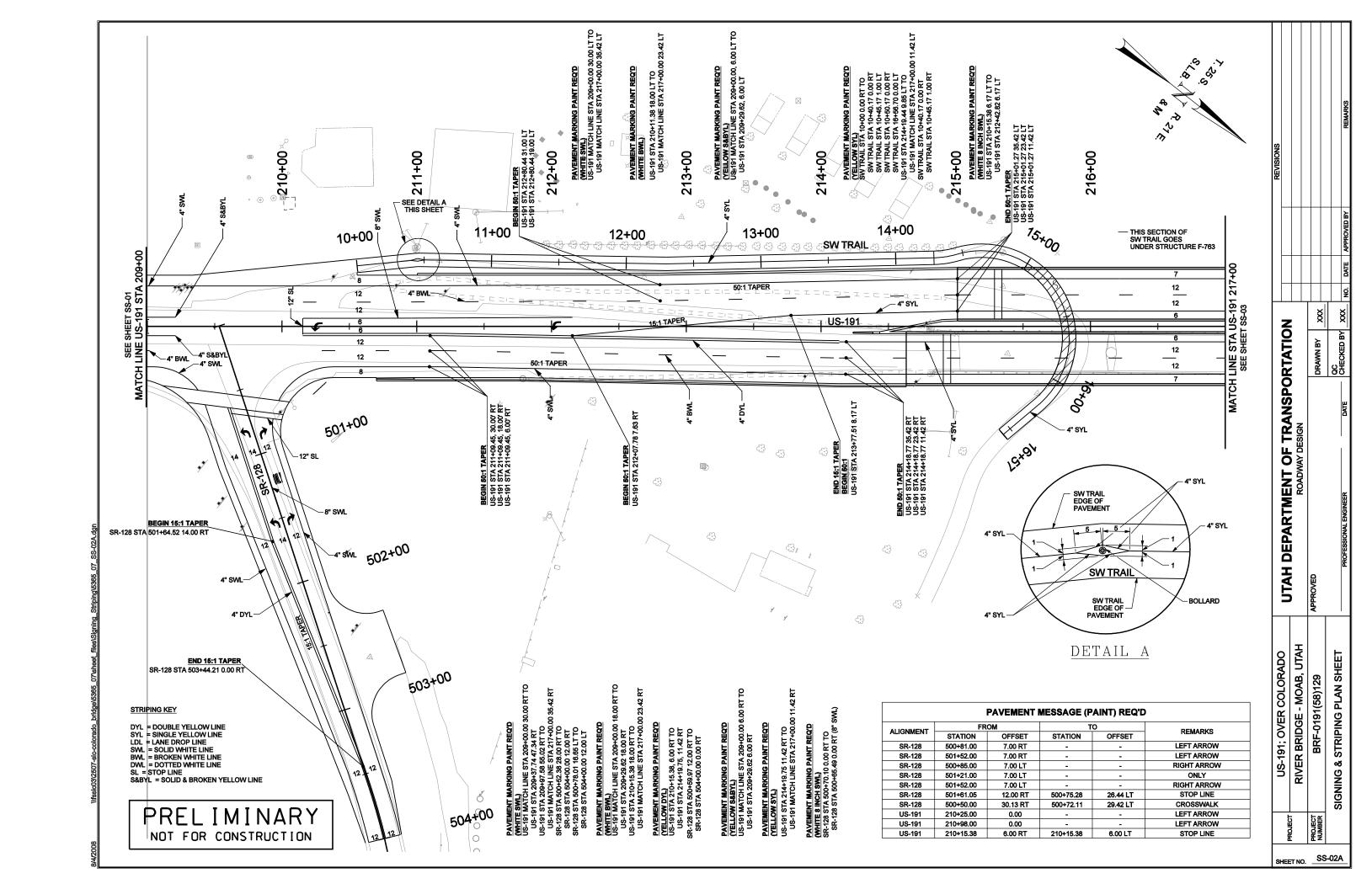


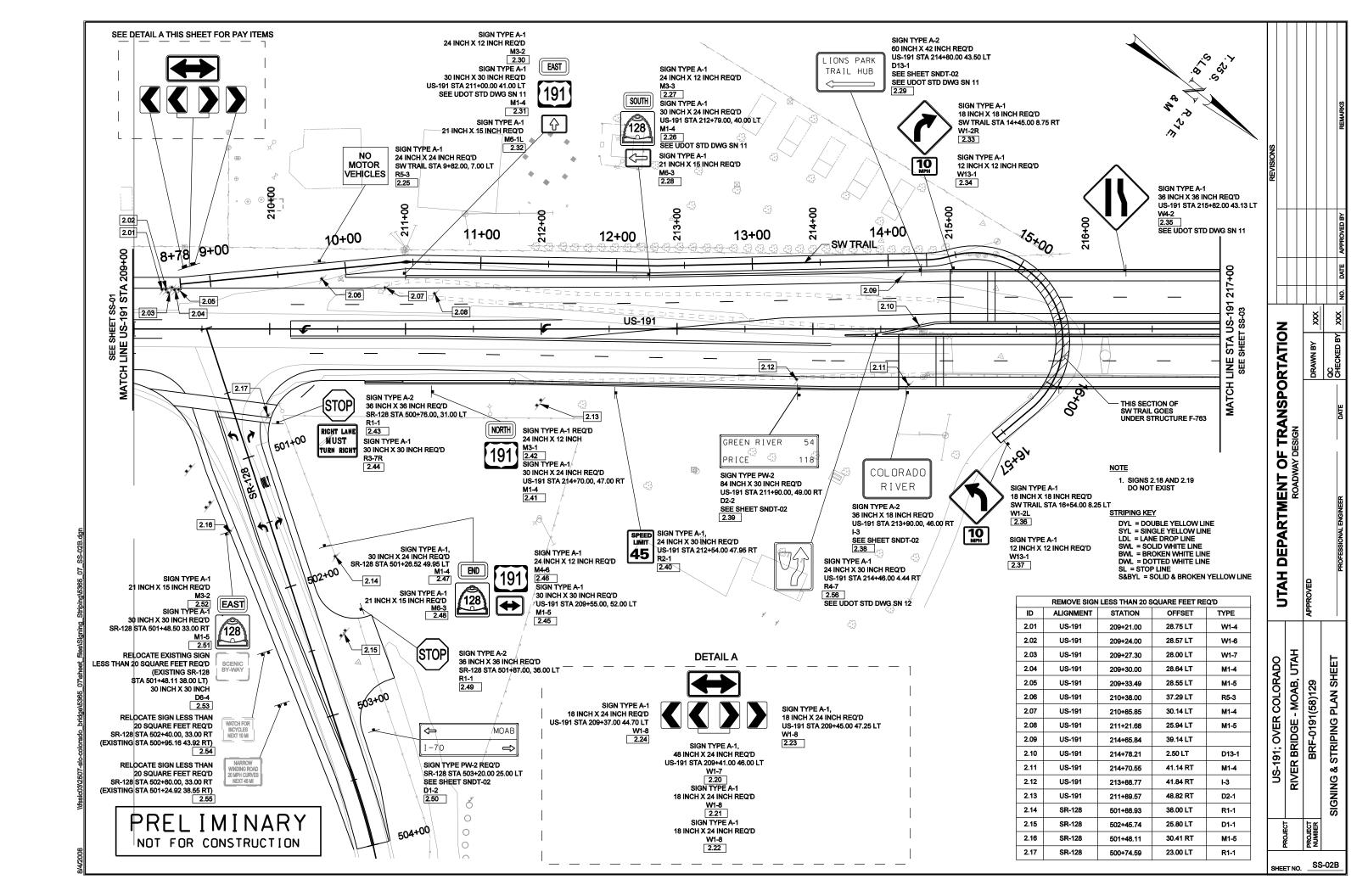


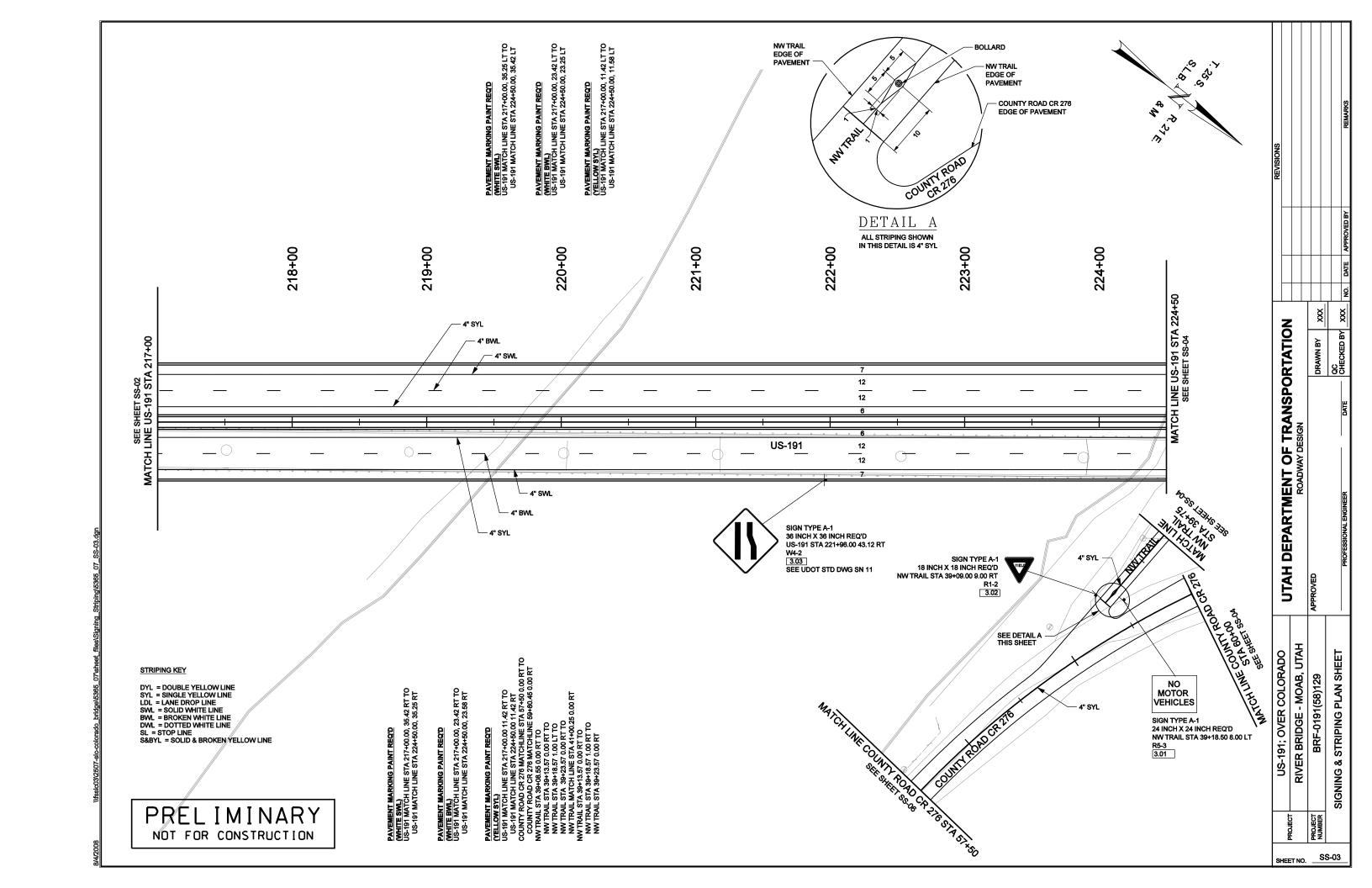


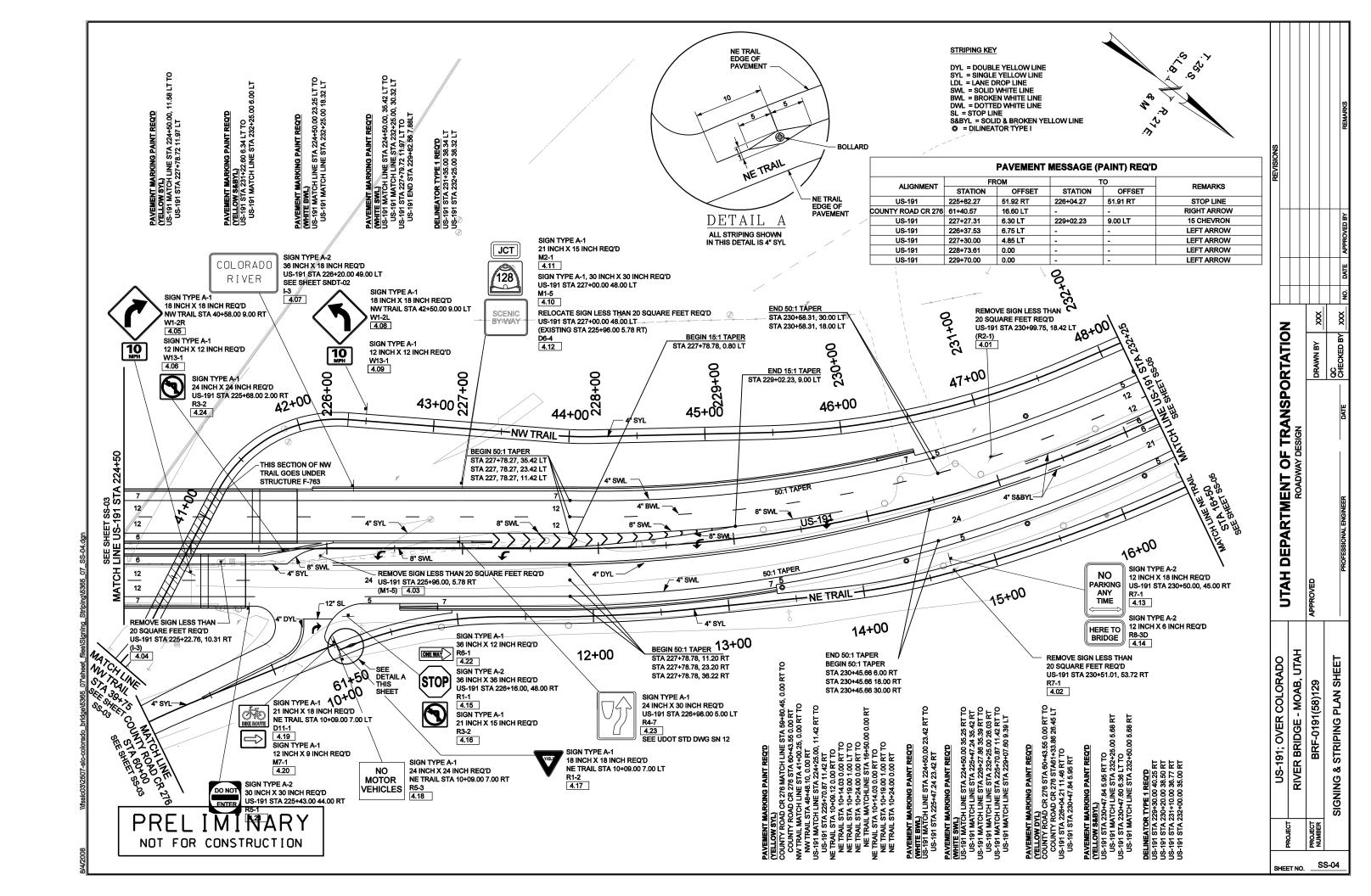


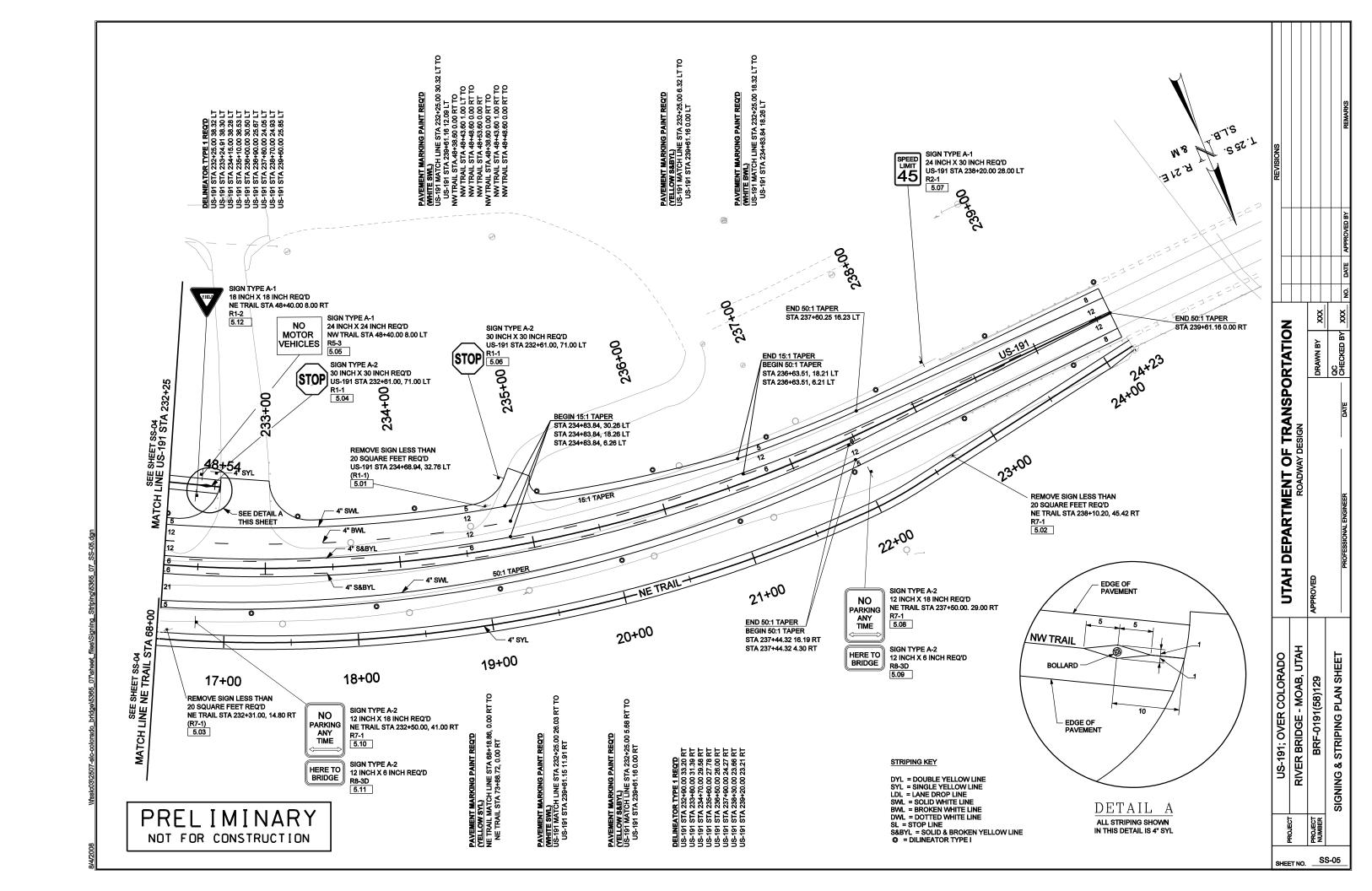


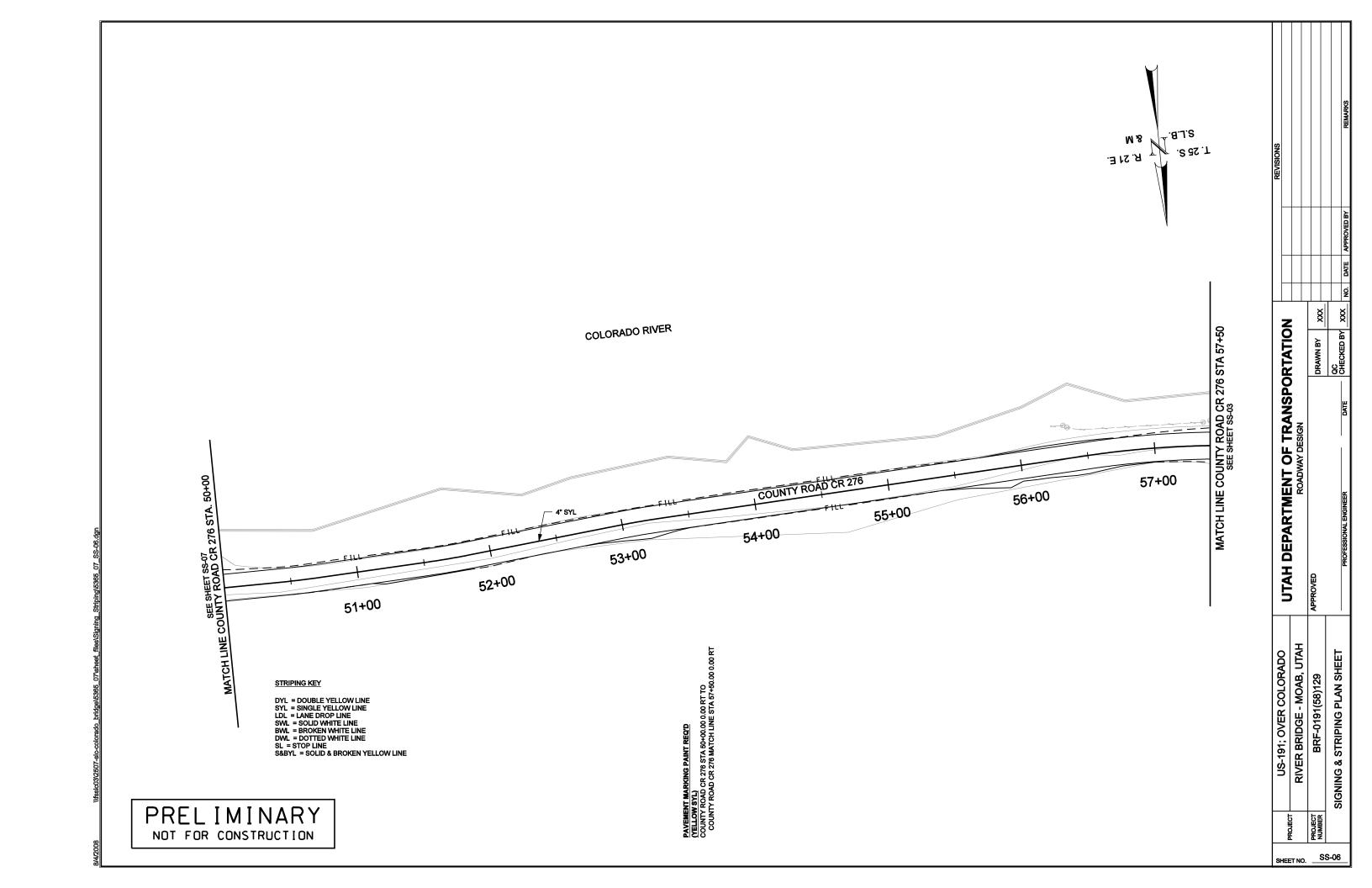


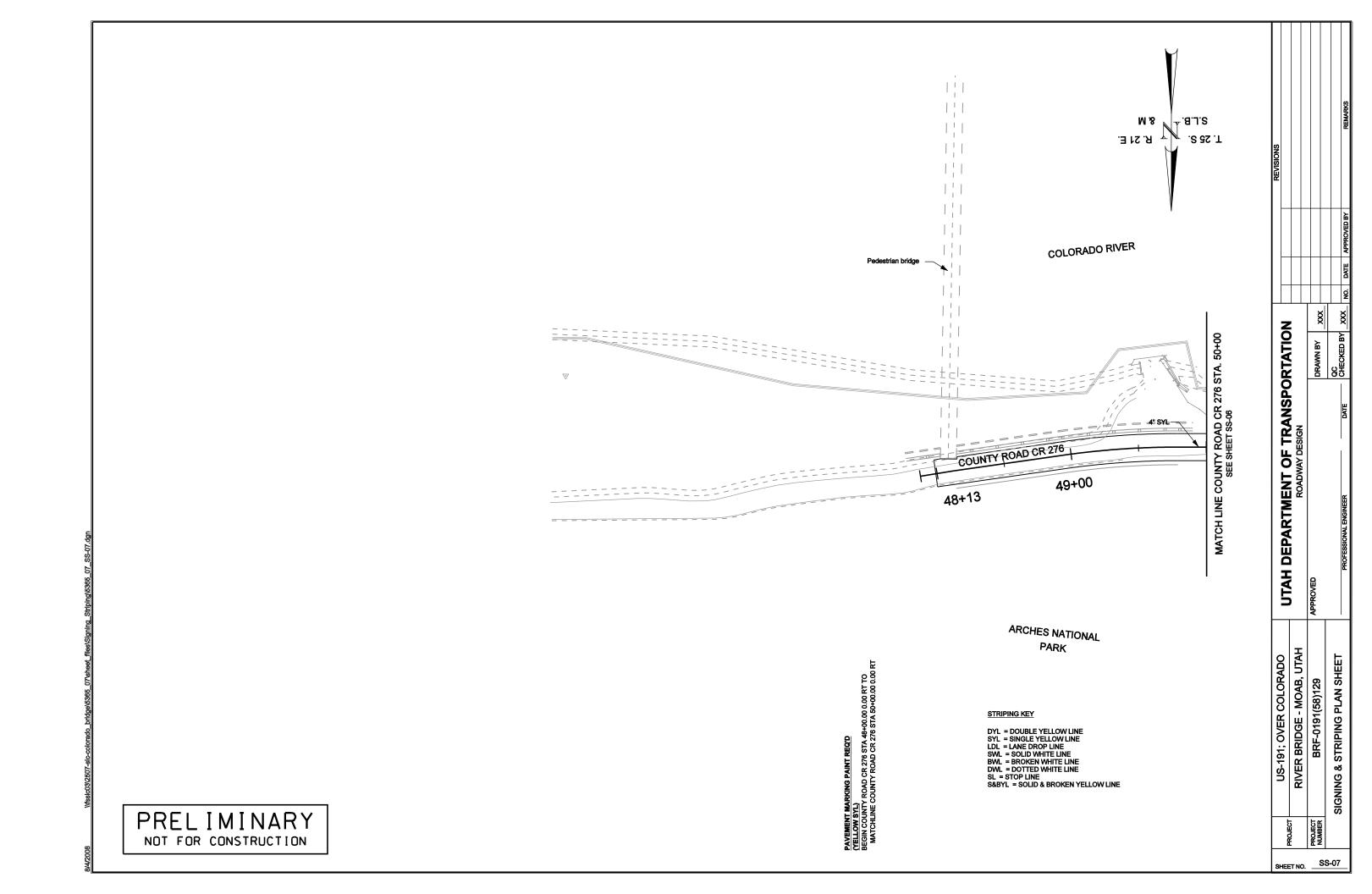




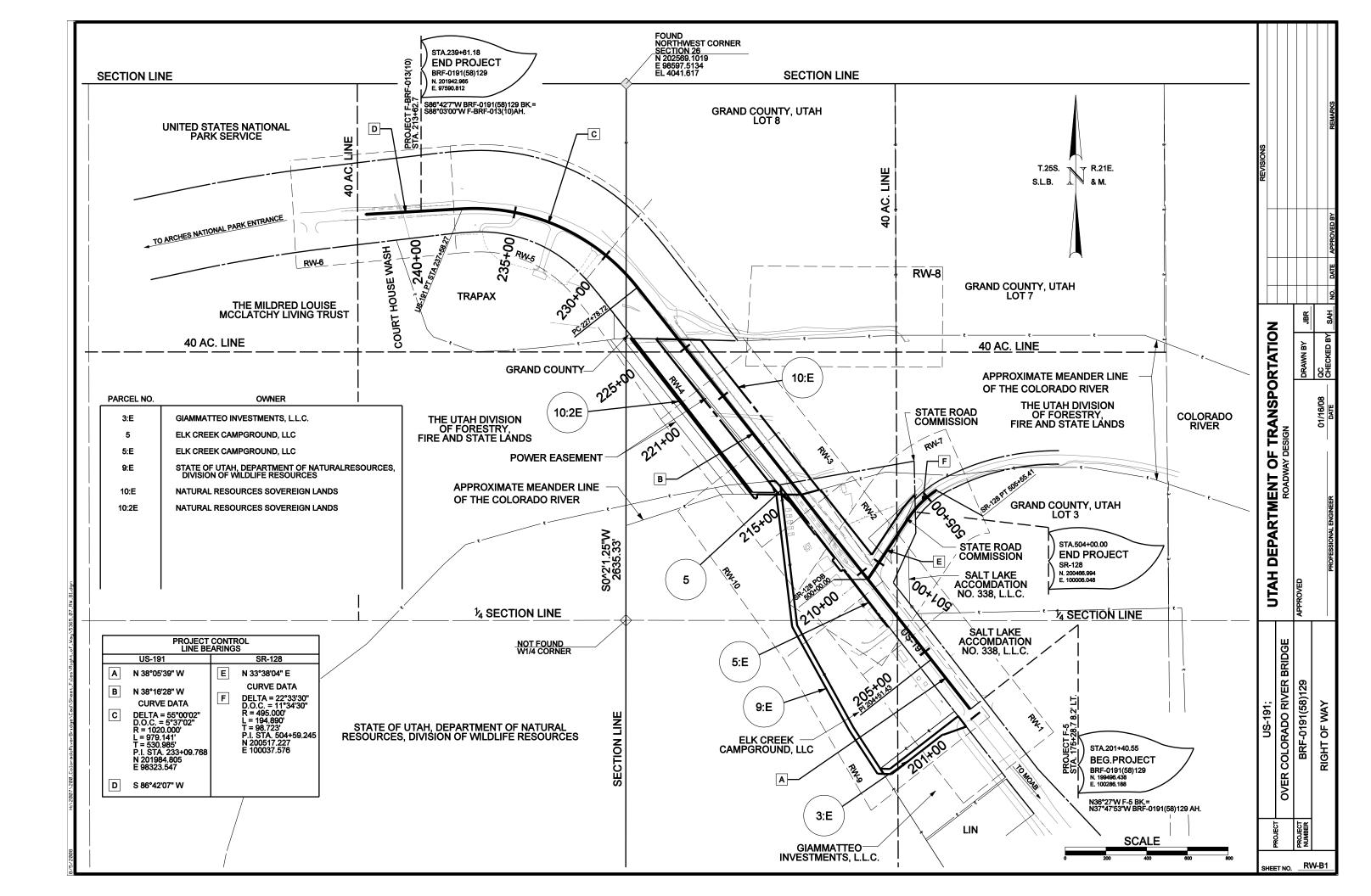


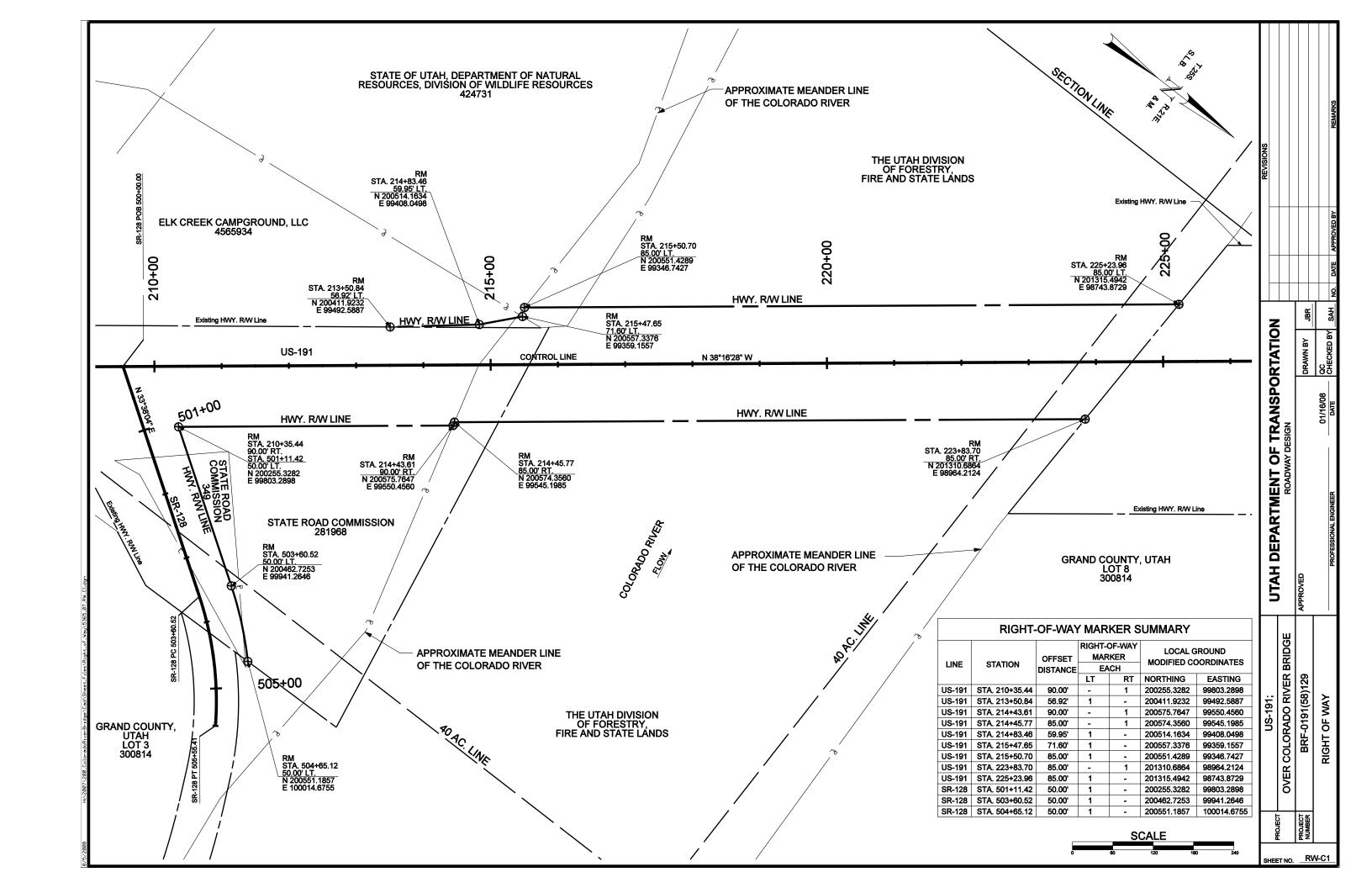


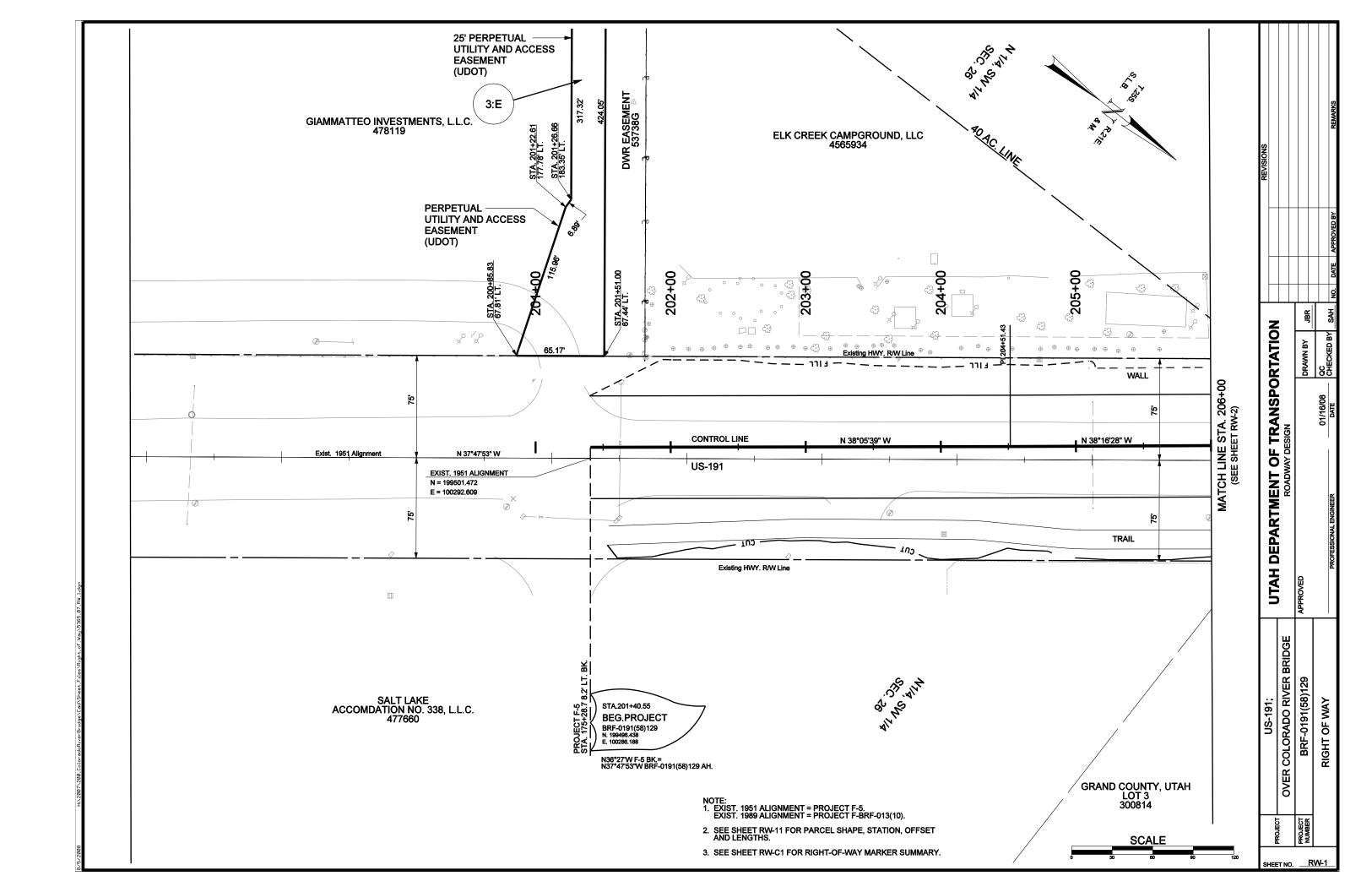


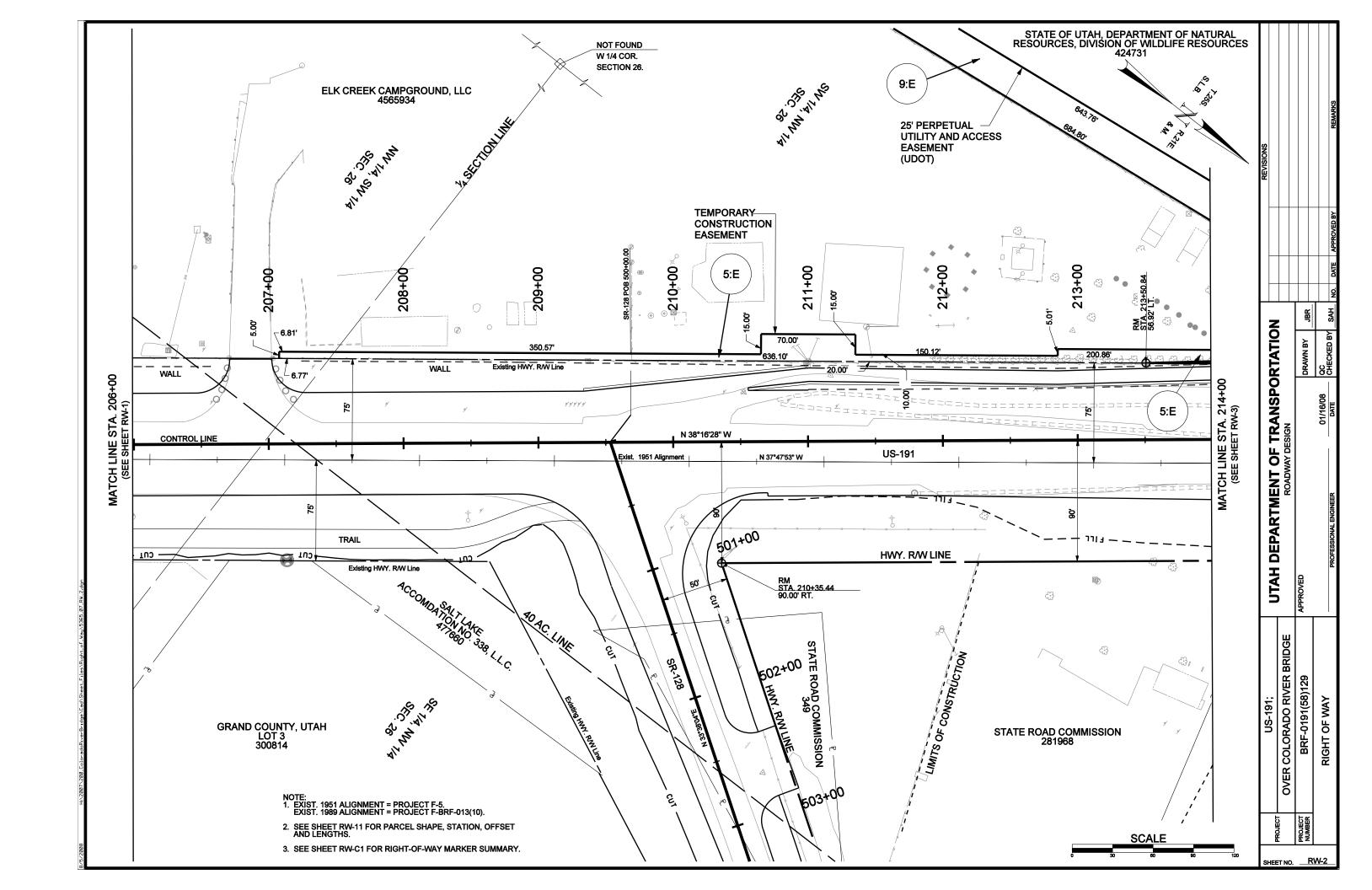


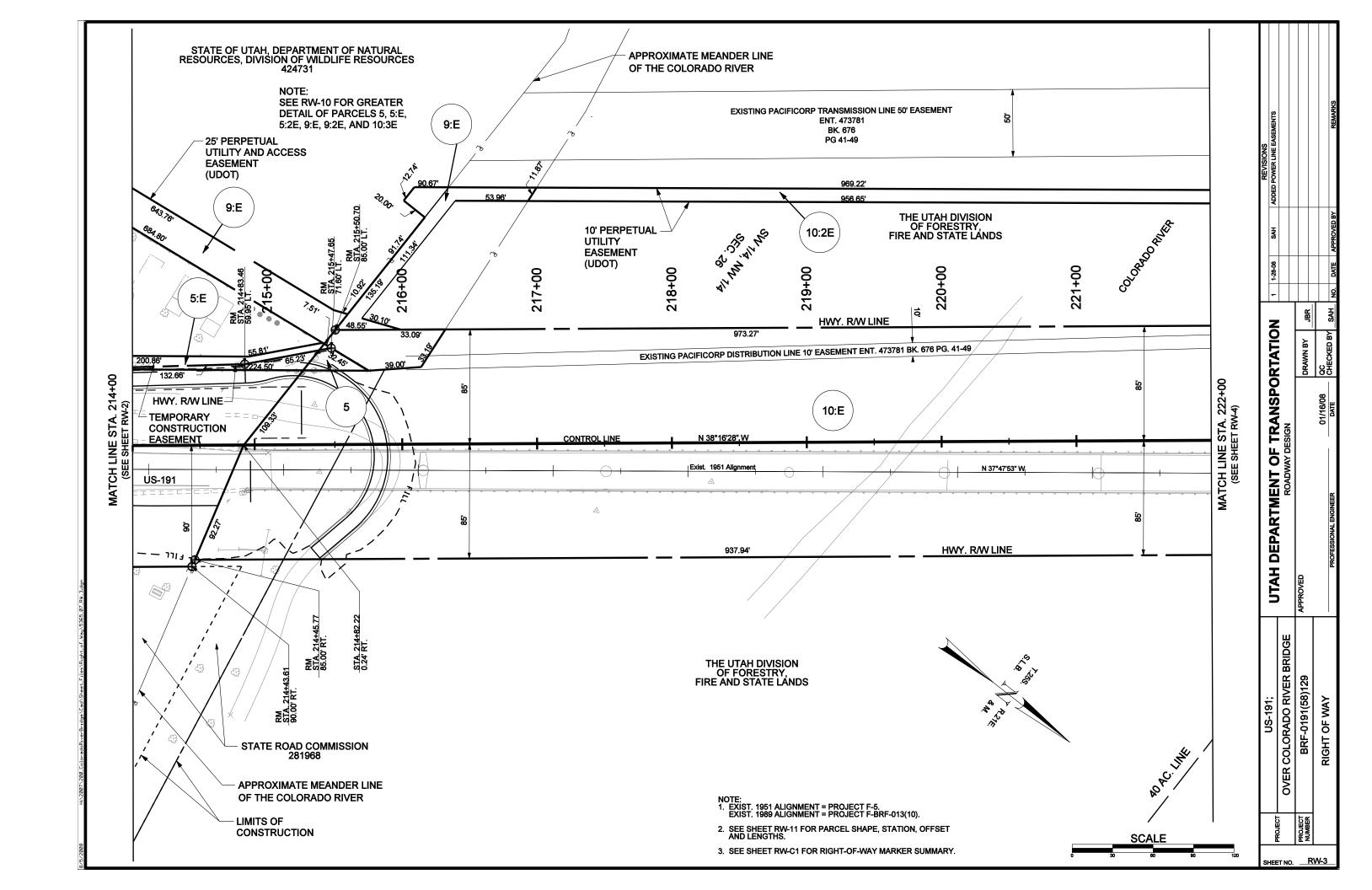
UTAH SHEET NO. SEE SHEET 1A FOR INDEX TO PLAN **UTAH** DEPARTMENT OF TRANSPORTATION U.S. Standard Units **MAJOR HIGHWAYS** (Inch-Pound Units) **ALL UNITS IN FEET UNLESS** OTHERWISE NOTED PLANS OF PROPOSED STATE ROAD PROJECT FUNDING SOURCE BRF-0191(58)129 **US-191: OVER COLORADO RIVER BRIDGE RIGHT OF WAY PLANS GRAND COUNTY** LENGTH 0.724 MILES BRF-0191(58)129 STA.239+61.18 END PROJECT T.25S. R.21E. S.L.B. & M. THIS SEAL APPLIES TO ALL SHEETS **CONTAINING THIS SIGNATURE** STA.201+40.55 VERIFIED FOR SUBMISSION FOR ADVERTISEMENT BEG.PROJECT N. 199496.438 E. 100286.188 **DESIGN ENGINEER UTAH DEPARTMENT OF TRANSPORTATION** APPROVED FOR USE BY UDOT REGION FOUR RW ENGINEER

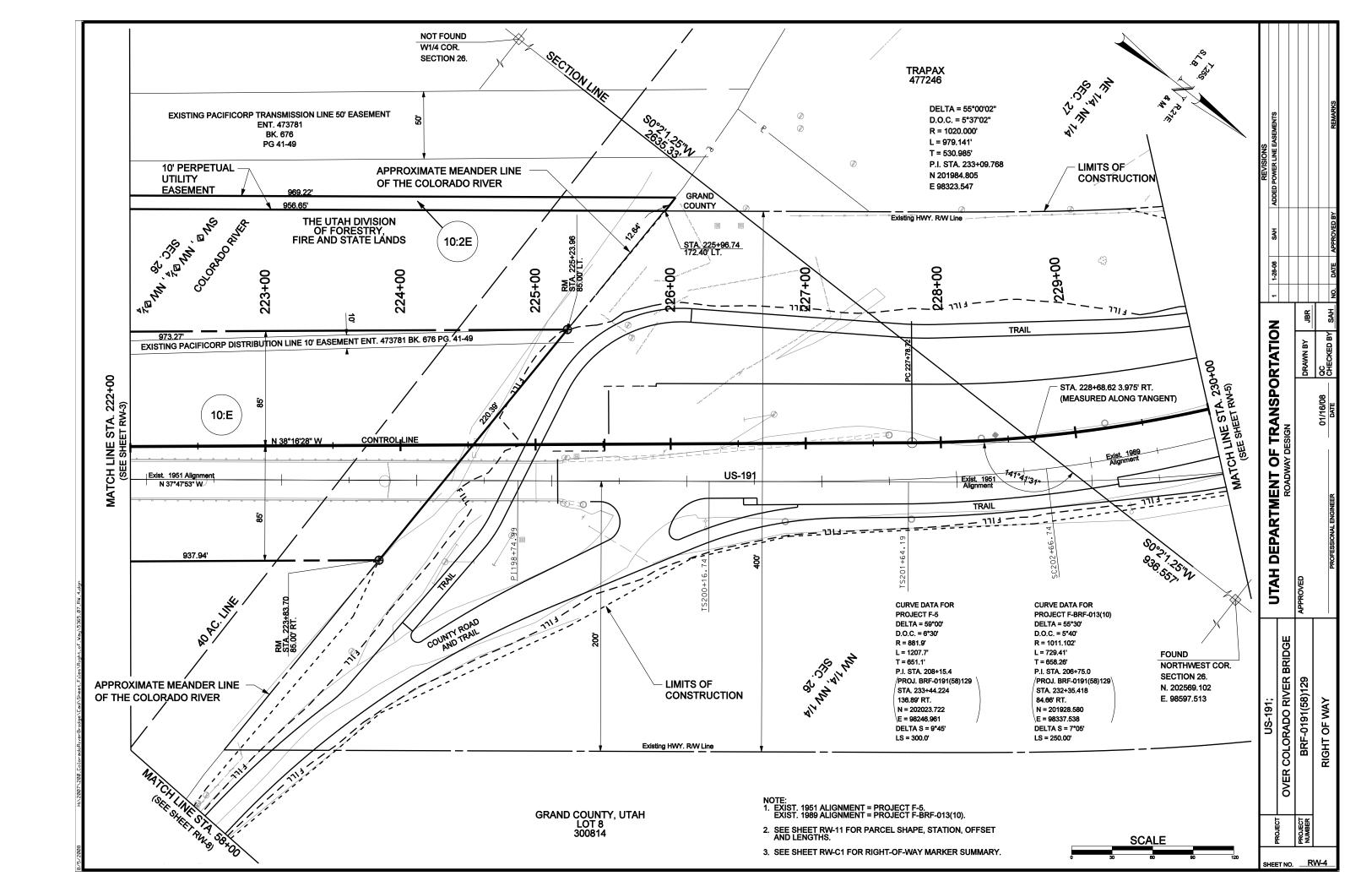


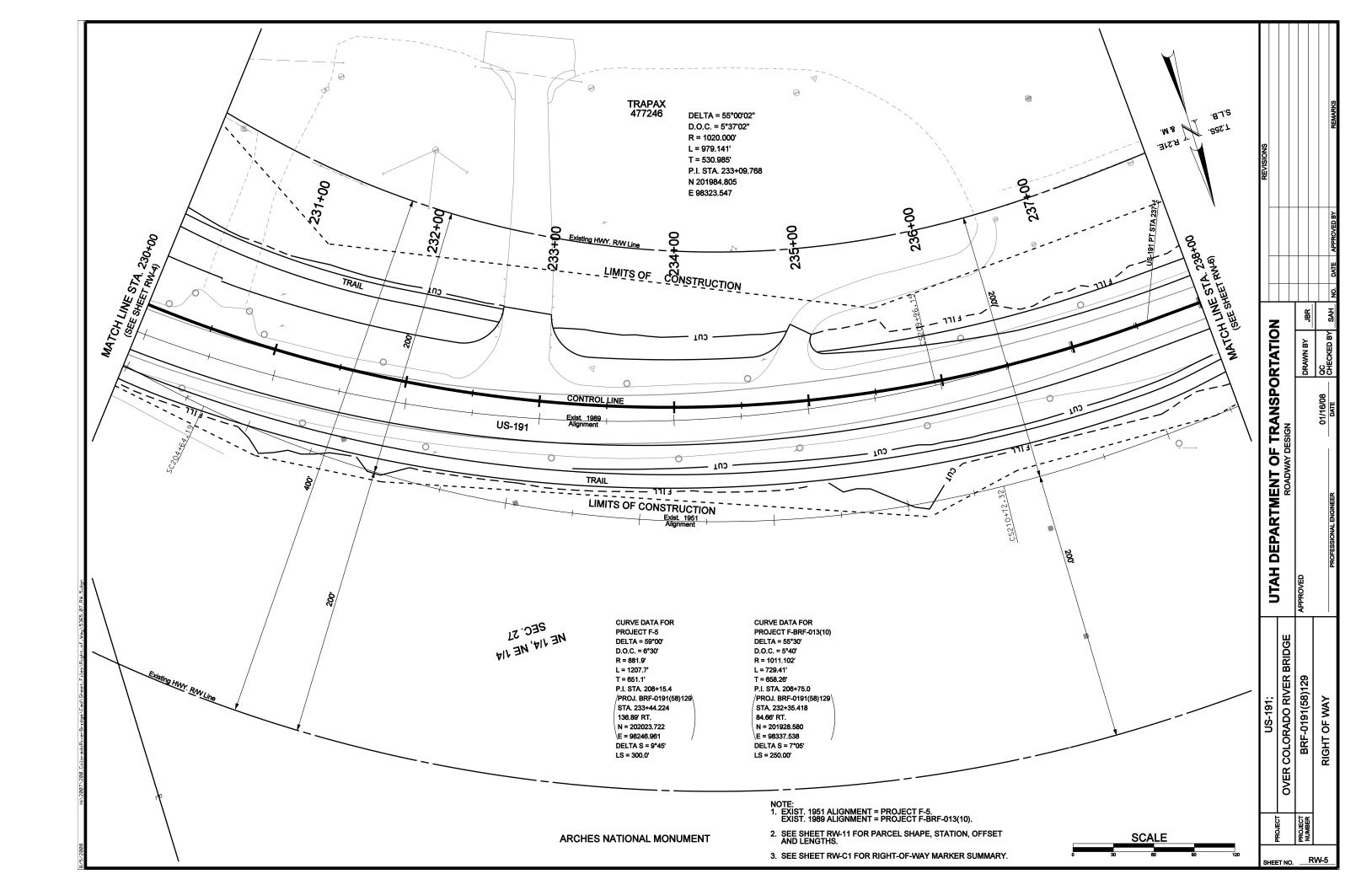


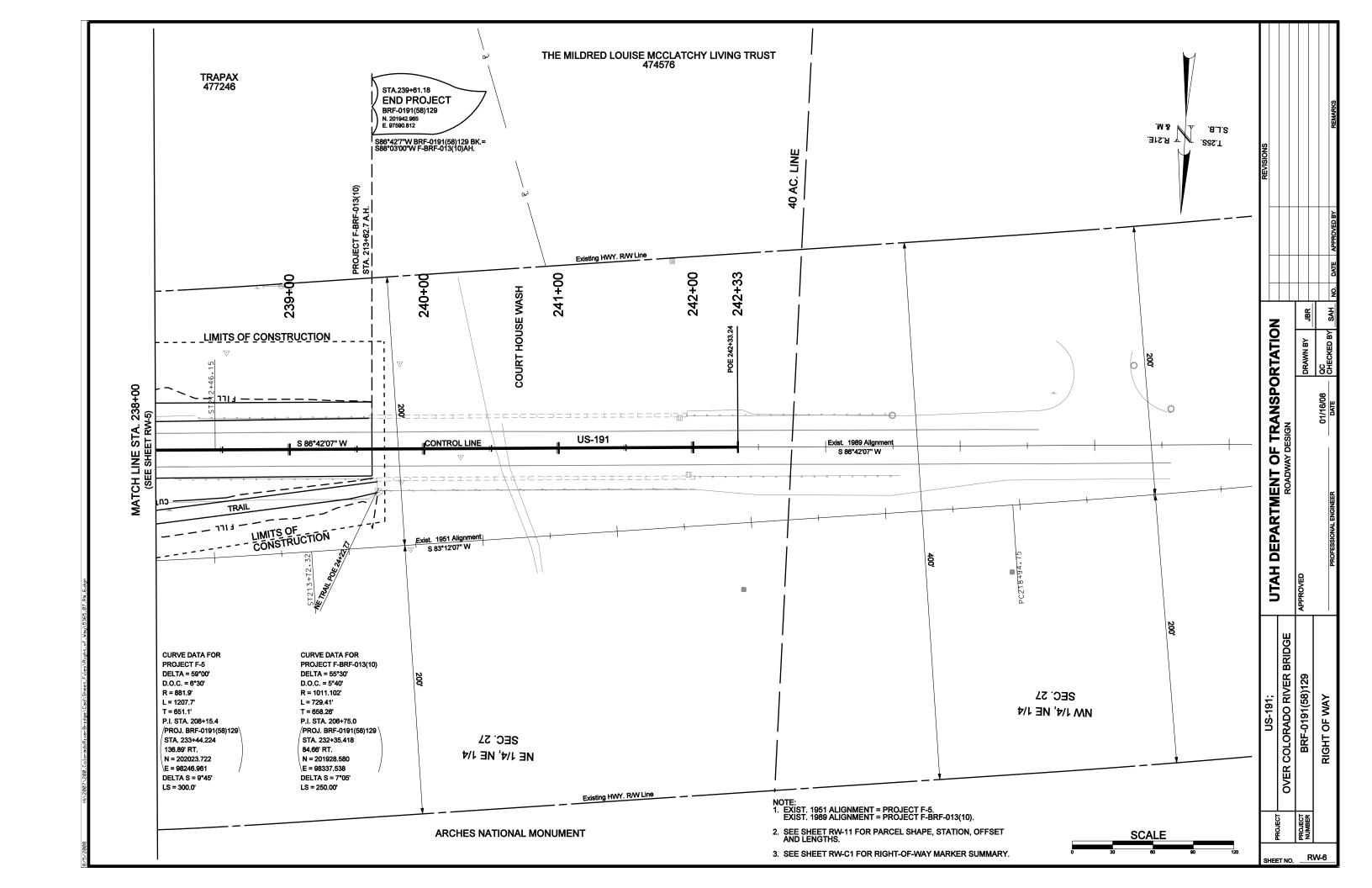


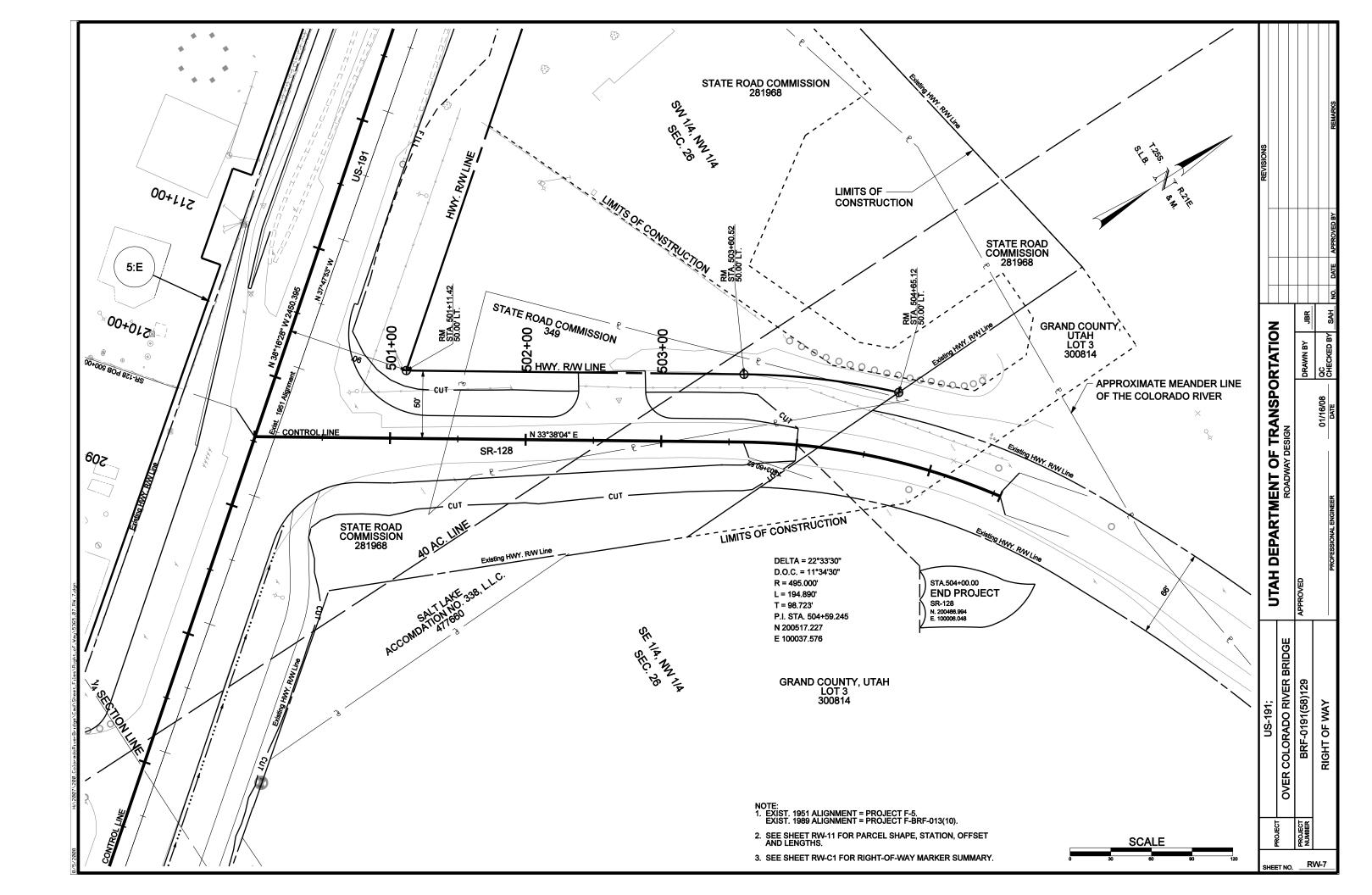


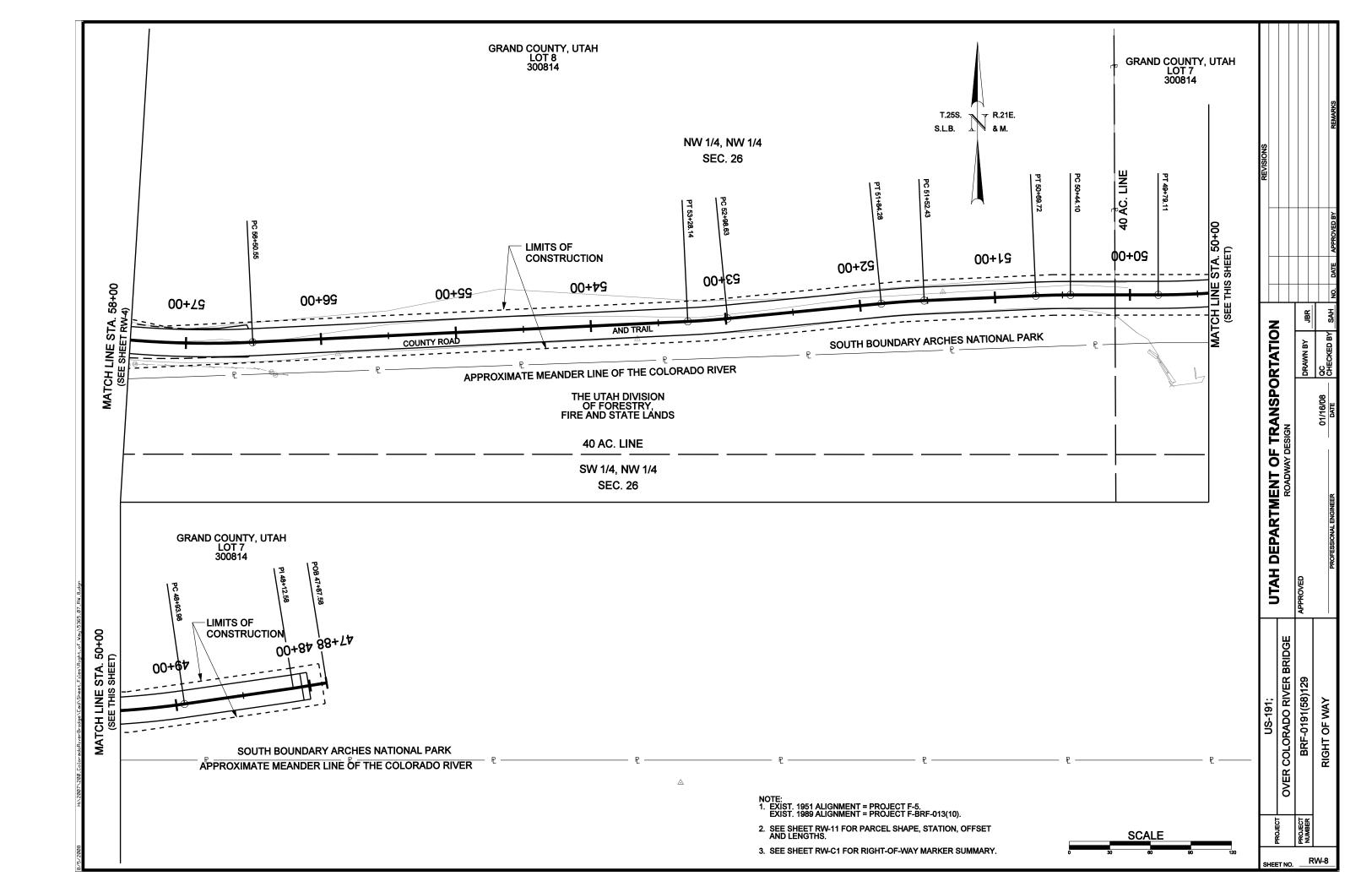


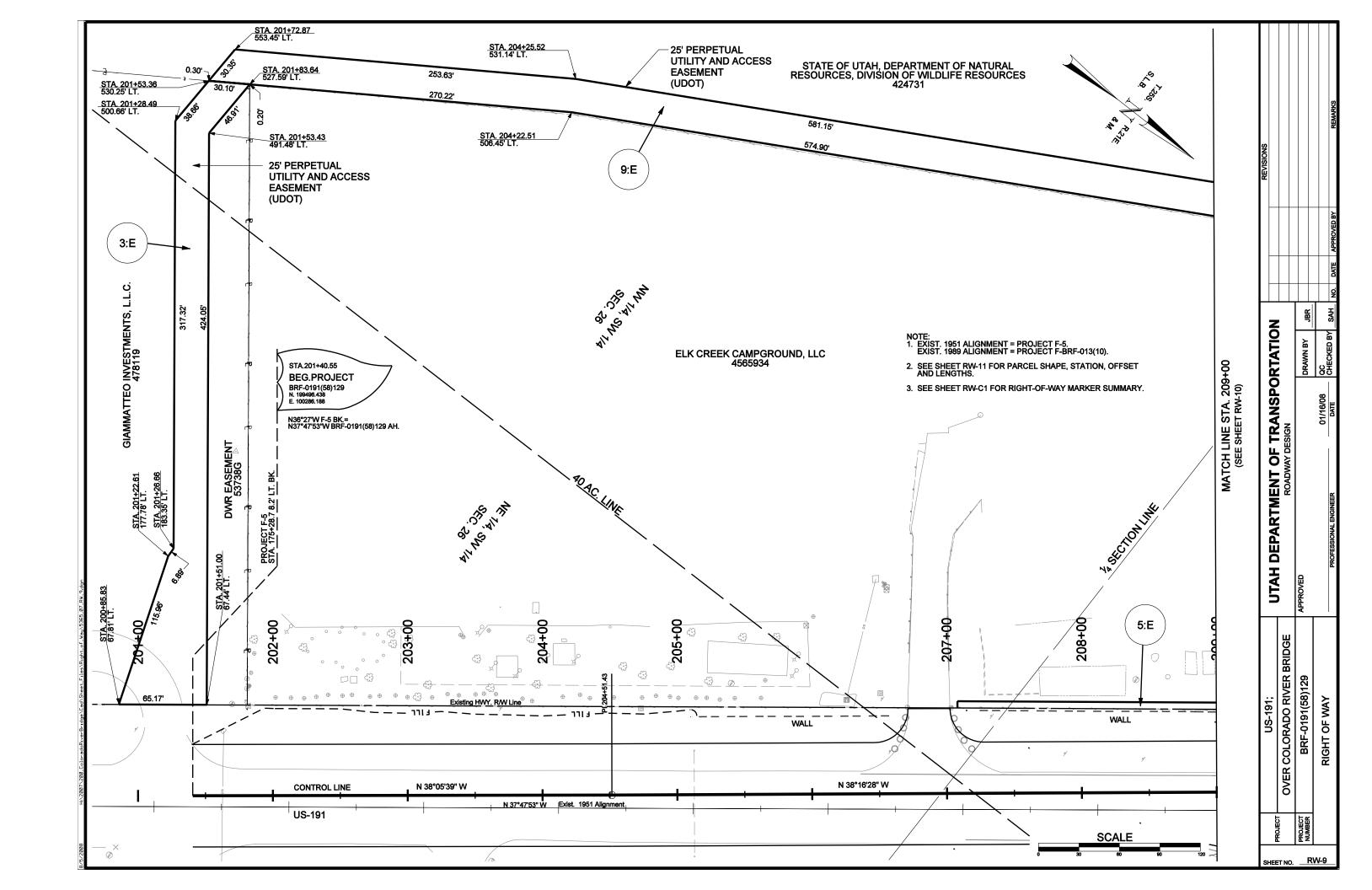


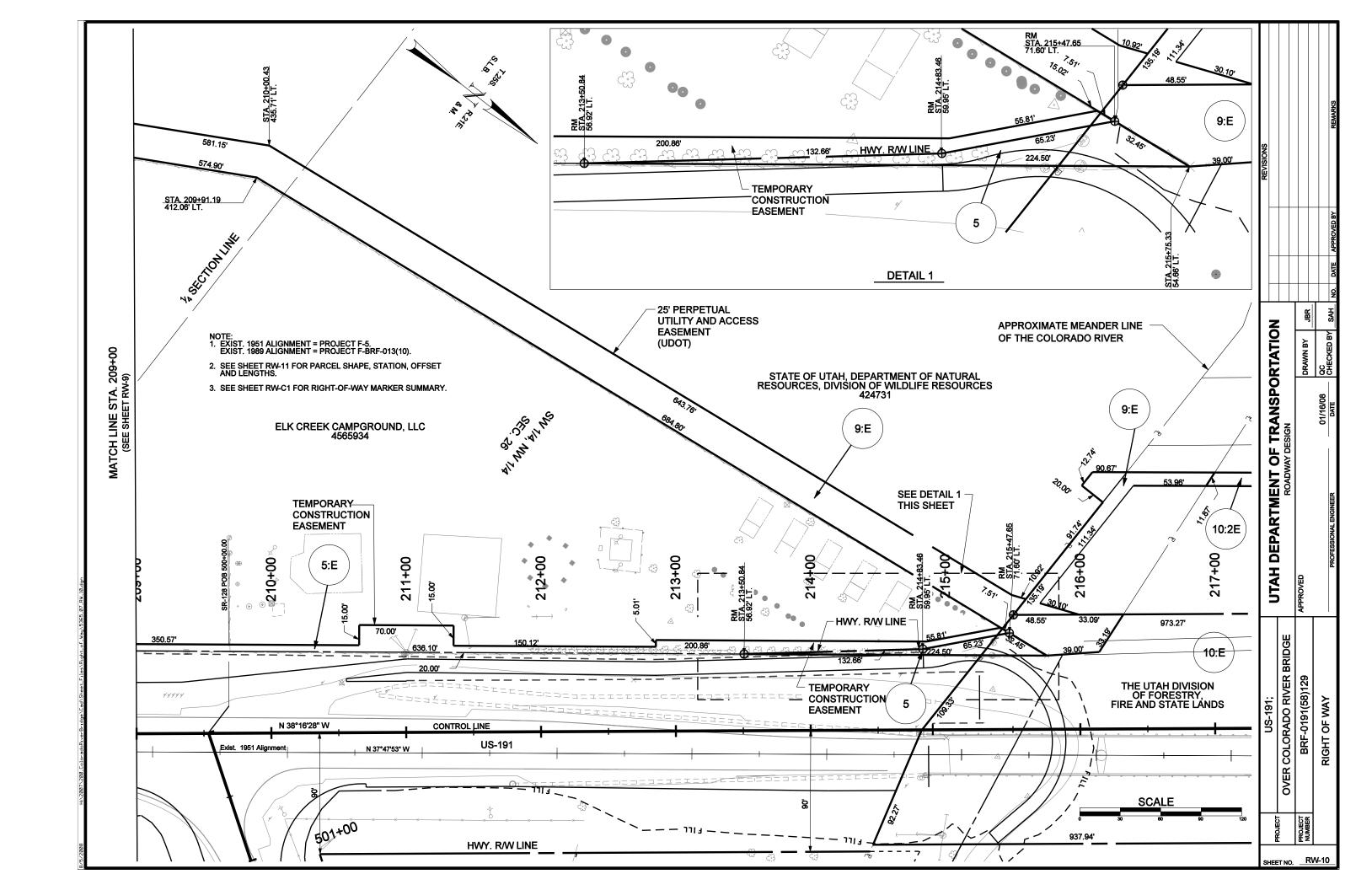


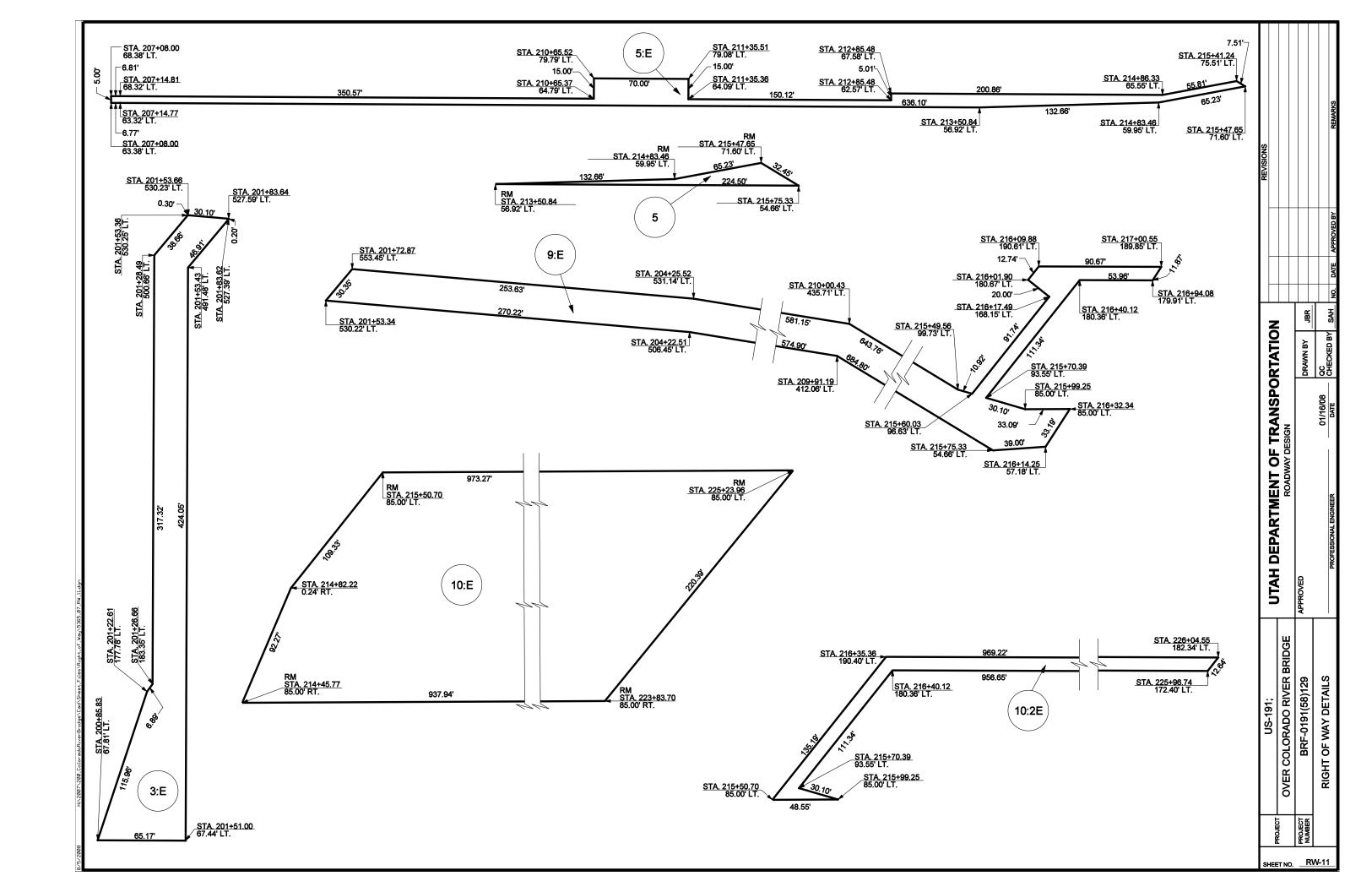












PARCEL NO.	OWNER	NET AC.	SQ. FT.	AC. IN DEED	AC.	LEFT	RIGHT
3:E	GIAMMATTEO INVESTMENTS, L.L.C.	0.327	14,230	-	4.2	PERPETUA	L EASEMENT
5	ELK CREEK CAMPGROUND, LLC	0.022	975	0.005	10.001	9.974	N/A
5:E	ELK CREEK CAMPGROUND, LLC	0.136	5,938	-	10.0	TEMPORAR	Y EASEMENT
9:E	STATE OF UTAH, DEPARTMENT OF NATURAL RESOURCES, DIVISION OF WILDLIFE RESOURCES	0.955	41,599	-	425.8	PERPETUA	L EASEMENT
10:E	THE UTAH DIVISION OF FORESTRY, FIRE AND STATE LANDS	3.760	163,800	-	N/A	PERPETUA	L EASEMENT
10:2E	THE UTAH DIVISION OF FORESTRY, FIRE AND STATE LANDS	0.254	11,070	-	N/A	PERPETUA	L EASEMENT

REVISIONS								ED BY REMARKS	
								: APPROV	
								IO. DATE	
	_			0	Š			SAH	
	RTATION			DRAWN BY			200	CHECKED BY SAH NO. DATE APPROVED BY	
	UTAH DEPARTMENT OF TRANSPORTATION	ROADWAY DESIGN		APPROVED			01/16/08	PROFESSIONAL ENGINEER DATE	
110 404	03-131,	OVER COLORADO RIVER BRIDGE		BRF-0191(58)129			RIGHT OF WAY SUMMARY		
PROJECT -				PROJECT) I College				
SI	IEE	T NC).		R۷	V.	-12		

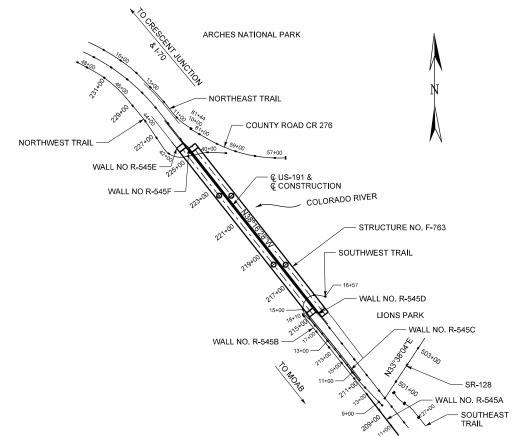
INDEX OF SHEETS TITLE SITUATION & LAYOUT I SITUATION & LAYOUT II SITUATION & LAYOUT III SITUATION & LAYOUT IV SITUATION & LAYOUT V SITUATION & LAYOUT VI SITUATION & LAYOUT VII SOIL DATA SHEET SOIL DATA SHEET SOIL DATA SHEET SOIL DATA SHEE SOIL DATA SHEET SOIL DATA SHEET BRIDGE HYDRAULIC DATA SHEET FOUNDATION LAYOUT I FOUNDATION LAYOUT I DRILLED SHAFT DETAILS DRILLED SHAFT DETAILS II FOOTING DIMS & REINFORCING II PIER 3 DIMS & REINFORCING I PIER 2 DIMS & REINFORCING II PIER 3 DIMS & REINFORCING II PIER CONNECTION DETAILS ABUTMENT 1 NB DIMS ABUTMENT 1 NB REINFORCING I ABUTMENT 1 NB REINFORCING I ABUTMENT 1 NB REINFORCING IV ABUTMENT 1 SB REINFORCING I ABUTMENT 1 SB REINFORCING III ABUTMENT 4 NB REINFORCING I ABUTMENT 4 NB REINFORCING II ABUTMENT 4 NB REINFORCING III ABUTMENT 4 NB REINFORCING IV ABUTMENT 4 SB DIMS 45 46 47 ABUTMENT 4 SB REINFORCING I ABUTMENT 4 SB REINFORCING II ABUTMENT 4 SB REINFORCING IV 48 49 50 51 52 53 54 55 56 57 58 59 BEARING DETAILS I NB SEGMENT DESIGNATION SB SEGMENT DESIGNATION CIP CONSTR. DIMS & PT DETAILS I CIP CONSTR. DIMS & PT DETAILS II CIP CONSTRUCTION REINFORCING CIP CONSTRUCTION REINFORCING II CIP CONSTRUCTION REINFORCING III CIP CONSTRUCTION REINFORCING IV 60 61 62 PIER TABLE DIMS & PT DETAILS II PIER TABLE DIMS & PT DETAILS IV PIER TABLE DIMS & PT DETAILS V 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 80 81 82 83 84 85 PIER TABLE REINFORCING I PIER TABLE REINFORCING II PIER TABLE REINFORCING III PIER TABLE REINFORCING I PIER TABLE REINFORCING V PIER TABLE REINFORCING V PIER TABLE REINFORCING VII PIER TABLE 3D INTEGRATED I PIER TABLE 3D INTEGRATED III ABUT. DIAPHRAGM DIMS & PT DETAILS ABUT. DIAPHRAGM REINFORCING I ABUT. DIAPHRAGM REINFORCING II ABUT. DIAPHRAGM REINFORCING III ABUT. DIAPH. 3D INTEGRATED I ABUT. DIAPH. 3D INTEGRATED II ABUT. DIAPH. 3D INTEGRATED III BULKHEAD DETAILS LONGITUDINAL PT LAYOUT LONGITUDINAL PT LAYOUT II LONGITUDINAL PT LAYOUT III PT QUANT. & STRESSING SCHEDULE PT GROUTING & PROTECTION DET. EXPANSION JOINT DETAILS I EXPANSION JOINT DETAILS III CONSTANT SLOPE BARRIER DET. APPROACH SLAB DETAILS I APPROACH SLAB DETAILS II APPROACH SLAB DETAILS II COFFERDAM SCHEMATICS BRIDGE DRAINAGE DETAILS VERMIN GUARD DETAILS **AESTHETIC FORM LINER DETAILS** CONCRETE COATING DETAILS ACCESS PLATFORM DETAILS I ACCESS PLATFORM DETAILS II ACCESS PLATFORM DETAILS III CONSTRUCTION SCHEMATIC I CONSTRUCTION SCHEMATIC III BRIDGE CONSTRUCTION STAGING CIP ON FALSEWORK DECK ELEV. BRIDGE REMOVAL II

SE	GMENT CONSTRUCTION SHE	EETS
SHEET NO.	TITLE	
111	SEGMENT 1B DIMS & PT DETAILS	
112	SEGMENT 1B REINFORCING I	
113 114	SEGMENT 1B REINFORCING II SEGMENT 2B DIMS & PT DETAILS	
115	SEGMENT 2B DIMS & FT DETAILS SEGMENT 2B REINFORCING I	
116	SEGMENT 2B REINFORCING II	
117 118	SEGMENT 3B DIMS & PT DETAILS SEGMENT 3B REINFORCING I	
119	SEGMENT 3B REINFORCING I SEGMENT 3B REINFORCING II	
120 121	SEGMENT 4B DIMS & PT DETAILS SEGMENT 4B REINFORCING I	
122	SEGMENT 4B REINFORCING II	
123	SEGMENT 5B DIMS & PT DETAILS	
124 125	SEGMENT 5B REINFORCING I SEGMENT 5B REINFORCING II	
126	SEGMENT 6B DIMS & PT DETAILS	
127 128	SEGMENT 6B REINFORCING I SEGMENT 6B REINFORCING II	
129	SEGMENT 7B DIMS & PT DETAILS	
130	SEGMENT 7B REINFORCING I SEGMENT 7B REINFORCING II	
131 132	SEGMENT /B REINFORCING II SEGMENT 8B DIMS & PT DETAILS	
133	SEGMENT 8B REINFORCING I	
134 135	SEGMENT 8B REINFORCING II	
136	SEGMENT 9B DIMS & PT DETAILS SEGMENT 9B REINFORCING I	
137	SEGMENT 9B REINFORCING II	
138 139	SEGMENT 9B REINFORCING III SEGMENT 10B DIMS & PT DETAILS	
140	SEGMENT 10B REINFORCING I	
141 142	SEGMENT 10B REINFORCING II SEGMENT 11B DIMS & PT DETAILS	
142	SEGMENT 11B DIMS & FT DETAILS SEGMENT 11B REINFORCING I	
144	SEGMENT 11B REINFORCING II	
145 146	SEGMENT 12B DIMS & PT DETAILS SEGMENT 12B REINFORCING I	
147	SEGMENT 12B REINFORCING II	
148 149	SEGMENT 1M DIMS & PT DETAILS SEGMENT 1M REINFORCING I	
150	SEGMENT 1M REINFORCING II	
151	SEGMENT 2M DIMS & PT DETAILS	
152 153	SEGMENT 2M REINFORCING I SEGMENT 2M REINFORCING II	
154	SEGMENT 3M DIMS & PT DETAILS	
155 156	SEGMENT 3M REINFORCING I SEGMENT 3M REINFORCING II	
157	SEGMENT 4M DIMS & PT DETAILS	
158 159	SEGMENT 4M REINFORCING I SEGMENT 4M REINFORCING II	
160	SEGMENT 4M KEINFORGING II SEGMENT 5M DIMS & PT DETAILS	
161	SEGMENT 5M REINFORCING I	
162 163	SEGMENT 5M REINFORCING II SEGMENT 6M DIMS & PT DETAILS	
164	SEGMENT 6M REINFORCING I	
165 166	SEGMENT 6M REINFORCING II SEGMENT 7M DIMS & PT DETAILS	
167	SEGMENT 7M PRINTS & PT DETAILS SEGMENT 7M REINFORCING I	
168	SEGMENT 7M REINFORCING II	
169 170	SEGMENT 8M DIMS & PT DETAILS SEGMENT 8M REINFORCING I	BF
171	SEGMENT 8M REINFORCING II	
172 173	SEGMENT 9M DIMS & PT DETAILS SEGMENT 9M REINFORCING I	
174	SEGMENT 9M REINFORCING II	INV.
175	SEGMENT 9M REINFORCING III SEGMENT 10M DIMS & PT DETAILS	OPER.
176 177	SEGMENT 10M DIMS & PT DETAILS SEGMENT 10M REINFORCING I	
178	SEGMENT 10M REINFORCING II	
179 180	SEGMENT 11M DIMS & PT DETAILS SEGMENT 11M REINFORCING I	
181	SEGMENT 11M REINFORCING II	
182 183	SEGMENT 12M DIMS & PT DETAILS SEGMENT 12M REINFORCING I	
183	SEGMENT 12M REINFORCING I SEGMENT 12M REINFORCING II	
185	BS CLOSURE DIMS & PT DETAILS	
186 187	BS CLOSURE REINFORCING I BS CLOSURE REINFORCING II	
188	MS CLOSURE DIMS & PT DETAILS	
189 190	MS CLOSURE REINFORCING I MS CLOSURE REINFORCING II	

MS CLOSURE REINFORCING I

BR	IDGE	LOAD RATING
		HL-93
	RATING	LOCATION
INV.	1.37	JOINT B12, LONG TERM, F STR I
OPER.	1.78	JOINT B12. LONG TERM, F STR I

TOTAL QUANTITIES - NB AN	ND SB B	RIDO	SES
ITEM	ESTIMATED	UNIT	AS CONSTRUCTED
GRANULAR BACKFILL BORROW (PLAN QUANTITY)	949	CY	-
DRILLED SHAFTS, 60 INCH	663	LF	-
DRILLED SHAFTS, 84 INCH	1,896	LF	-
BRIDGE BEARING DEVICE (DISC)	24	EA	-
FLOWABLE FILL	709	CY	-
STRUCTURAL STEEL	12,608	LB	-
STRUCTURAL CONCRETE AA(B6)(AE)	1	LS	-
STRUCTURAL CONCRETE AA(B4)(AE)	1	LS	-
CONSTANT SLOPE BRIDGE BARRIER	4,308	LF	-
REINFORCING STEEL - COATED (PLAN QUANTITY)	1,717,264	LB	-
REINFORCING STEEL (PLAN QUANTITY)	222,596	LB	-
POST-TENSIONING STEEL STRAND (LONGITUDINAL) (PLAN QUANTITY)	740,197	LB	-
POST-TENSIONING STEEL STRAND (TRANSVERSE) (PLAN QUANTITY)	75,644	LB	-
POST-TENSIONING STEEL BAR (PLAN QUANTITY)	8,632	LB	-
CONCRETE COATING	175,464	SF	=
MODULAR EXPANSION JOINT (0-6")	74	LF	-
MODULAR EXPANSION JOINT (0-15")	74	LF	-
BRIDGE DRAIN	12	EA	-
FORM TRAVELERS	1	LS	-
REMOVE BRIDGE	1	FA	-



LOCATION PLAN

(EXISTING STRUCTURE C-285 NOT SHOWN FOR CLARITY)

GENERAL NOTES

- 1 REINFORCING STEEL IS DEFORMED BILLET STEEL BARS CONFORMING TO AASHTO M 284 AND AASHTO M 31 (ASTM A615) GRADE 60. ALL BARS IN ELEMENTS COMPLETELY BELOW GROUND ARE UNCOATED, ALL OTHER BARS ARE EPOXY COATED.
- 2. ALL POST-TENSIONING STEEL IS SEVEN WIRE, 0.6" DIAMETER LOW RELAXATION STRAND CONFORMING TO ASTM A-416, GRADE 270.
- 3. EXPOSED CONCRETE CORNERS ARE CHAMFERED $\$\!\!/\!\!\!/$ EXCEPT WHERE NOTED OTHERWISE.
- 4. COVER TO REINFORCING STEEL:

SUPERSTRUCTURE:

TOP OF INTEGRAL WEARING SURFACE: 4 ½" ALL OTHER SURFACES:

SURFACES CAST AGAINST FORMS: SURFACES CAST AGAINST EARTH:

5. CAST-IN-PLACE CONCRETE CLASS: SUPERSTRUCTURE: STRUCTURAL CONCRETE AA(B6)(AE) STRUCTURAL CONCRETE AA(B4)(AE) STRUCTURAL CONCRETE AA(B4)(AE) APPROACH SLABS: STRUCTURAL CONCRETE AA(B4)(AE)

DESIGN DATA

HL-93 WITH IMPACT (DESIGN TRUCK OR TANDEM WITH CONCURRENT DESIGN LANE LOAD) IN ACCORDANCE WITH CURRENT AASHTO LRFD AND INTERIM SPECIFICATIONS.

CAST-IN-PLACE CONCRETE: fc = 6000 PSI FOR SUPERSTRUCTURE fc = 4000 PSI FOR SUBSTRUCTURE fy = 60 KSI FOR MILD REINFORCING STEEL fu = 270 KSI FOR POST-TENSIONING STRAND

WEARING SURFACE:

 $2\ \mbox{\ensuremath{\%^{\prime\prime}}}$ INTEGRAL CONCRETE WEARING SURFACE CAST WITH GIRDER, WITH ALLOWANCE FOR $\mbox{\ensuremath{\%^{\prime\prime}}}$ (MAX.) SURFACE GRINDING TO ACHIEVE ACCEPTABLE RIDING SURFACE.

DESIGN SPEED

SEISMIC DESIGN DATA: MAY 2007 AASHTO "GUIDE SPECIFICATIONS FOR LRFD SEISMIC BRIDGE DESIGN CRITERIA" 1033 YEAR DESIGN RETURN PERIOD, SITE CLASS 'C'; $F_{\nu}S_{\nu}=0.07g$; OPERATIONAL PERFORMANCE

US191 50 MPH

- 1. FOR PLAN AND ELEVATION VIEWS, SEE SITUATION & LAYOUT III THROUGH VI SHEETS.
- 2. FOR TYPICAL SECTIONS, SEE SITUATION & LAYOUT VII SHEET
- 3. FOR DESIGN CRITERIA, SEE SITUATION & LAYOUT II SHEET.
- *4. FOR INFORMATION ONLY PLAN QUANTITIES STRUCTURAL CONCRETE AA(B6)(AF) - 7 947 C) STRUCTURAL CONCRETE AA(B4)(AE) - 2,777 CY
- QUANTITY SHOWN FOR CONCRETE COATING IS FOR BRIDGE ONLY. SEE ROADWAY AND WALL PLANS FOR ADDITIONAL QUANTITIES.

TRANSPORTATION DEPARTMENT ORAD LAYOUT MOAB ∞ర RIDGE **UATION** GRAND COUNTY F-763 DRG. NO

sнт. 1 ог 190

DESIGN SPECIFICATIONS:

- 1. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS,"FOURTH EDITION, 2007
- 2. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS "GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION OF SEGMENTAL CONCRETE BRIDGES," SECOND EDITION, 1999, WITH 2003 REVISIONS, EXCEPT SECTION 28 OF DIVISION I IS WAIVED FOR THIS CONTRACT. THE LEVEL OF DETAIL AND SUBMITTAL REQUIREMENTS IS AS SHOWN IN THE PLANS AND SPECIFICATIONS
- 3. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS," SECOND EDITION, 2004, WITH INTERIMS
- 4. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS "AASHTO GUIDE DESIGN SPECIFICATIONS FOR BRIDGE TEMPORARY WORKS." 1995
- 5. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS "AASHTO GUIDE MANUAL FOR CONDITION EVALUATION AND LOAD AND RESISTANCE FACTOR RATING (LRFR) OF HIGHWAY BRIDGES," FIRST EDITION, 2003, WITH INTERIMS THROUGH 2005
- 6. MAY 2007 AASHTO "GUIDE SPECIFICATIONS FOR LRFD SEISMIC BRIDGE DESIGN CRITERIA."
- 7 LITAH DEPARTMENT OF TRANSPORTATION (UDOT) "STRUCTURES DESIGN AND DETAILING
- 8. UTAH DEPARTMENT OF TRANSPORTATION (UDOT) "STANDARD AND SUPPLEMENTAL
- 9. UTAH DEPARTMENT OF TRANSPORTATION (UDOT) "STANDARD AND SUPPLEMENTAL
- 10. CEB-FIP "MODEL CODE,"1978, THIRD EDITION, FOR CONCRETE TIME-DEPENDENT

B. CONSTRUCTION SPECIFICATIONS:

- 1. UTAH DEPARTMENT OF TRANSPORTATION (UDOT) "STANDARD AND SUPPLEMENTAL SPECIFICATIONS," 2008.
- 2. UTAH DEPARTMENT OF TRANSPORTATION (UDOT) "SPECIAL PROVISIONS," 2008.

C. DESIGN LOADING:

- 1. PERMANENT LOADS (DC, DW, EH, EV, ES, EL):
 - A. UNIT WEIGHT OF POST-TENSIONED AND REINFORCED CONCRETE: 150 pcf
 - B. UNIT WEIGHT OF FLOWABLE FILL CONCRETE: 145 pcf
 - C. BARRIER: 42" HIGH, UDOT CONSTANT SLOPE: 570 plf.
 - D. UTILITY ALLOWANCE: 100 plf
 - E. WEARING SURFACE TYPE: INTEGRAL CONCRETE 2 1/2" (4 1/2" COVER): 30 psf
 - F UNIT WEIGHT OF FILL SOIL: 150 pcf.
 - G. HORIZONTAL EARTH PRESSURE: 42 psf/ft
- 2. LIVE LOADS (LL. IM. PL. CE. BR. LS):

(DESIGN TRUCK OR TANDEM AND DESIGN LANE LOAD).

AS PER "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" WITH "OPEN COUNTRY" SURFACE CONDITION USED FOR DESIGN.

- 4. THERMAL FORCES (TU. TG. FR):
 - A. MEAN TEMPERATURE: 50° F
 - B. THERMAL COEFFICIENT: 0.000006/ ° F
 - C. SEASONAL VARIATION:
 - TEMPERATURE FALL
 - D. TEMPERATURE GRADIENT

AS PER "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS", ZONE 1

- 5. CREEP AND SHRINKAGE (CR, SH, FR): STRAINS ARE CALCULATED IN ACCORDANCE WITH "CEB-FIP MODEL CODE", 1978, WITH A RELATIVE HUMIDITY OF 50%
- 6. STREAM PRESSURE AND BUOYANCY (WA + B)
 - AS PER "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS"
 - A. STRENGTH AND SERVICE LIMIT STATES: 100 YEAR FLOOD VELOCITY: 9.0 FT/S WATER SURFACE ELEVATION: 3974.12'
 - B. EXTREME EVENT LIMIT STATE: 500 YEAR FLOOD VELOCITY: 9.6 FT/S WATER SURFACE ELEVATION: 3977.00'
- 7. EXTREME EVENTS (EQ, CT):
 - A. EARTHQUAKE: MAY 2007 AASHTO "GUIDE SPECIFICATIONS FOR LRFD SEISMIC BRIDGE DESIGN CRITERIA", SITE CLASS "C", WITH A 1033-YEAR DESIGN RETURN PERIOD FOR THE MAXIMUM CONSIDERED EARTHQUAKE, $0.07g~(F_vS_1)$. OPERATIONAL PERFORMANCE OBJECTIVE UTILIZED FOR DESIGN.
 - B. VEHICULAR COLLISION FORCES IN ACCORDANCE WITH "AASHTO LRFD BRIDGE DESIGN
- 8. LOAD COMBINATIONS AS PER "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" n. = 1.0, n. = 1.0, n. = 1.05

D. MATERIALS:

- 1. CONCRETE (28-DAY CYLINDER STRENGTH AS NOTED):
 - A. SUPERSTRUCTURE: * . f'c = 6000 psi
 - B. SUPERSTRUCTURE (BARRIERS, APPROACH SLABS): *, fc = 4000 psi
 - C. SUBSTRUCTURE (ABUTMENT, PIERS, FOOTINGS): *, fc = 4000 psi
 - D. DRILLED SHAFTS: * . fc = 4000 psi
 - * MIX DESIGN PARAMETERS ARE SPECIFIED IN THE PROJECT SPECIAL PROVISIONS
- 2. REINFORCING STEEL:
 - A. ALL DEFORMED REINFORCING BARS ARE ASTM M 284 & M 31 (ASTM A615), GRADE 60
 - B. ALL BARS ARE EPOXY COATED, EXCEPT FOR BARS IN DRILLED SHAFTS AND PIER FOOTINGS WHICH ARE UNCOATED (BLACK)
 - C. CONCRETE COVER (UNLESS SHOWN OTHERWISE IN THE PLANS): SUPERSTRUCTURE
 - TOP OF INTEGRAL WEARING SURFACE 4 ½ IN 2. ALL OTHER SURFACES

SUBSTRUCTURE

SURFACES CAST AGAINST FORMS
 SURFACES CAST AGAINST EARTH

3. POST-TENSIONING STEEL:

A. STRAND: ASTM A-416, SEVEN-WIRE GRADE 270, LOW RELAXATION STRAND SIZE APPARENT MODULUS 0.6"DIAMETER 28,500 KSI 203 KSI (75% OF ULTIMATE) MAXIMUM JACKING STRESS MAXIMUM ANCHORING STRESS 189 KSI (70% OF ULTIMATE) ANCHOR SET 3/8 IN

FRICTION COEFFICIENT 0.0 (EXTERNAL TENDONS) WOBBLE COEFFICIENT 0.0002 (INTERNAL TENDONS)

B BARS

ASTM A722, GRADE 150 MAXIMUM JACKING STRESS
MAXIMUM ANCHORING STRESS

120 KSI (80% OF ULTIMATE) 105 KSI (70% OF ULTIMATE)

E. ALLOWABLE STRESSES/LOADS:

1. DESIGN METHOD:

THE SUPERSTRUCTURE IS DESIGNED FOR APPLICABLE SERVICE AND STRENGTH LIMIT STATES AS DEFINED BY THE LOAD GROUPS IN THE LRFD SPECIFICATIONS. THE SUBSTRUCTURE IS DESIGNED FOR THE APPLICABLE STRENGTH AND EXTREME
EVENT LIMIT STATES AS DEFINED BY THE LOAD GROUPS IN THE LRFD SPECIFICATIONS
AND CHECKED FOR THE CRACK CONTROL PROVISIONS IN SECTION 5.7.3.4 OF THE

2. SUPERSTRUCTURE CONCRETE STRESSES (SERVICE CRITERIA):

TENSION: 3/fc psi (0.0949/fc ksi) (CAST-IN-PLACE)

COMPRESSION: 0.45f'c psi (DUE TO POST-TENSIONING AND PERMANENT LOADS) Φ., 0.6fc psi (ALL OTHER LOAD CASES ΦwPER AASHTO LRFD SECTION 5.7.4.7

3. SUPERSTRUCTURE CONCRETE STRESSES (TEMPORARY STRESS CRITERIA)

TENSION: 3√f'c psi (0.09491√f'c ksi) (CAST-IN-PLACE)

COMPRESSION: 0.55f'ci psi, NOT TO EXCEED \$\Phi_w\$ 0.6f'ci ps

4. SUPERSTRUCTURE CONCRETE STRESSES (CONSTRUCTION CRITERIA):

TENSION: PER AASHTO LRFD TABLE 5.14.2.3.3-1 (CAST-IN-PLACE)

COMPRESSION: 0.50fci psi, NOT TO EXCEED Φ_w 0.6fci psi

5. SEGMENT CASTING AND ERECTION:

- A. MINIMUM CONCRETE STRENGTH BEFORE STRESSING LONGITUDINAL AND TRANSVERSE POST-TENSIONING, RELEASING FORMWORK, AND ADVANCING TRAVELERS: 4000 psi
- B. FOR PURPOSES OF DESIGN, AVERAGE AGE OF SEGMENTS FOR ADVANCEMENT OF ORM TRAVELERS ASSUMED TO BE: 2 DAYS
- C. FOR PURPOSES OF DESIGN. AVERAGE CASTING CYCLE FOR A PAIR OF SEGMENTS
- D. CONSTRUCTION LOAD COMBINATIONS PER "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS."

F. FOUNDATIONS:

1 FOUNDATION TYPE

DRILLED SHAFTS IN MUDSTONE/SILTSTONE/SANDSTONE/CONGLOMERATE ROCK PIER FOUNDATIONS: 84" DIAMETER ABUTMENT FOUNDATIONS: 60" DIAMETER

2 DESIGN METHOD:

SSIGN ME HOUS:
ULTIMATE SIDE SHEAR RESISTANCE CALCULATED IN ACCORDANCE WITH AASHTO LRFD 2007
4th EDITION, CHAPTER 10. A RESISTANCE FACTOR OF 0.55 WAS USED FOR DESIGN. END
BEARING NOT DEVELOPED AND IGNORED IN DESIGN. SEE DRILLED SHAFT DETAILS II SHEETS FOR PLOTS OF DRILLED SHAFT CAPACITY VERSUS DEPTH

G. HYDRAULICS

1. DESIGN FLOOD ELEVATIONS: 50 YR FLOOD + 2' FREEBOARD: 100 YR FLOOD: 500 YR FLOOD: LOW CHORD:

2. WATER LEVELS:

THE WATER SURFACE ELEVATIONS OF THE COLORADO RIVER WILL VARY DUE TO MANMADE
AND NATURAL CAUSES, WITH SEASONAL FLUCTUATIONS DUE TO SNOW MELT THE DOMINANT
CONTRIBUTER. CONSIDER ALL POSSIBLE VARIATIONS IN WATER LEVELS, LOW AND HIGH, WHEN
PREPARING THE BID. CONTRACT ADJUSTMENTS WILL NOT BE MADE DUE TO ANY WATER LEVELS
OR FLUCTUATIONS.

3. HISTORICAL WATER SURFACE ELEVATIONS:
THE TABLE BELOW SHOWS THE HISTORICAL WATER SURFACE ELEVATIONS IMMEDIATELY
UPSTREAM OF THE PROJECT SITE FOR EACH MONTH BETWEEN THE YEARS 1913 AND 2007.
ACTUAL ELEVATIONS MAY BE HIGHER OR LOWER DURING THE PROJECT DURATION.

MONTH MEDIAN FLOWS PEAK FLOWS JANUARY 3954.70' 3956.91' FEBRUARY 3954.77 3957.35' MARCH 3955.00 3960.37 APRII 3956.51 3965.54' MAY 3960.44 3971.26' JUNE 3961.15 3971.86 JULY 3956.51 3969.13' AUGUS1 3955.09 3961.05'

3955.02'

3955 15'

3955.12

3954 84'

3961.89'

3962 07'

3958.01

3957.38'

*NORMAL POOL ELEVATION: 3954.96' **MEAN HIGH WATER ELEVATION:

SEPTEMBER

OCTOBER

NOVEMBER

DECEMBER

*NORMAL POOL ELEVATION DENOTES THE HISTORICAL AVERAGE WATER ELEVATION DURING THE NON-RUNOFF PERIOD OF AUGUST THROUGH MARCH. **MEAN HIGH WATER ELEVATION DENOTES THE HISTORICAL ANNUAL HIGH WATER ELEVATION DURING THE RUNOFF PERIOD OF APRIL THOUGH JULY.

4. SCOUR DESIGN DATA

THE 100 YEAR AND 500 YEAR SCOUR DEPTHS WERE IDENTICAL. THE APPLICATION OF THE AASHTO LRFD LIMIT STATES ARE AS FOLLOWS:

1. NO SCOUR:

SERVICE, STRENGTH, EXTREME EVENT

2. 100 YEAR AND 500 YEAR SCOUR (IDENTICAL): SERVICE, STRENGTH, EXTREME EVENT

DESIGN SCOUR DEPTHS (100 YEAR AND 500 YEAR):

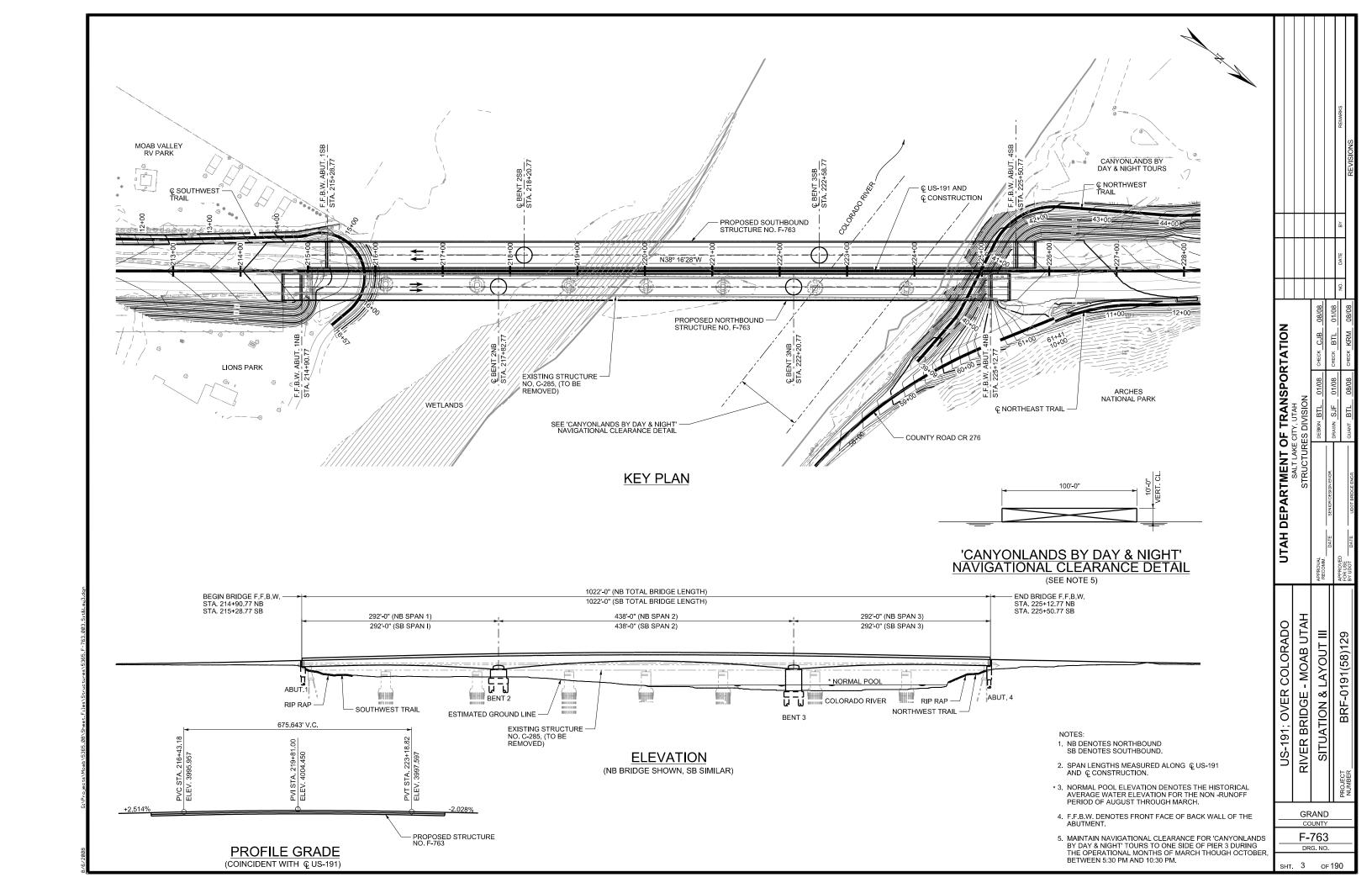
PIER 2 AND 3: SCOUR TO EL. 3934.00

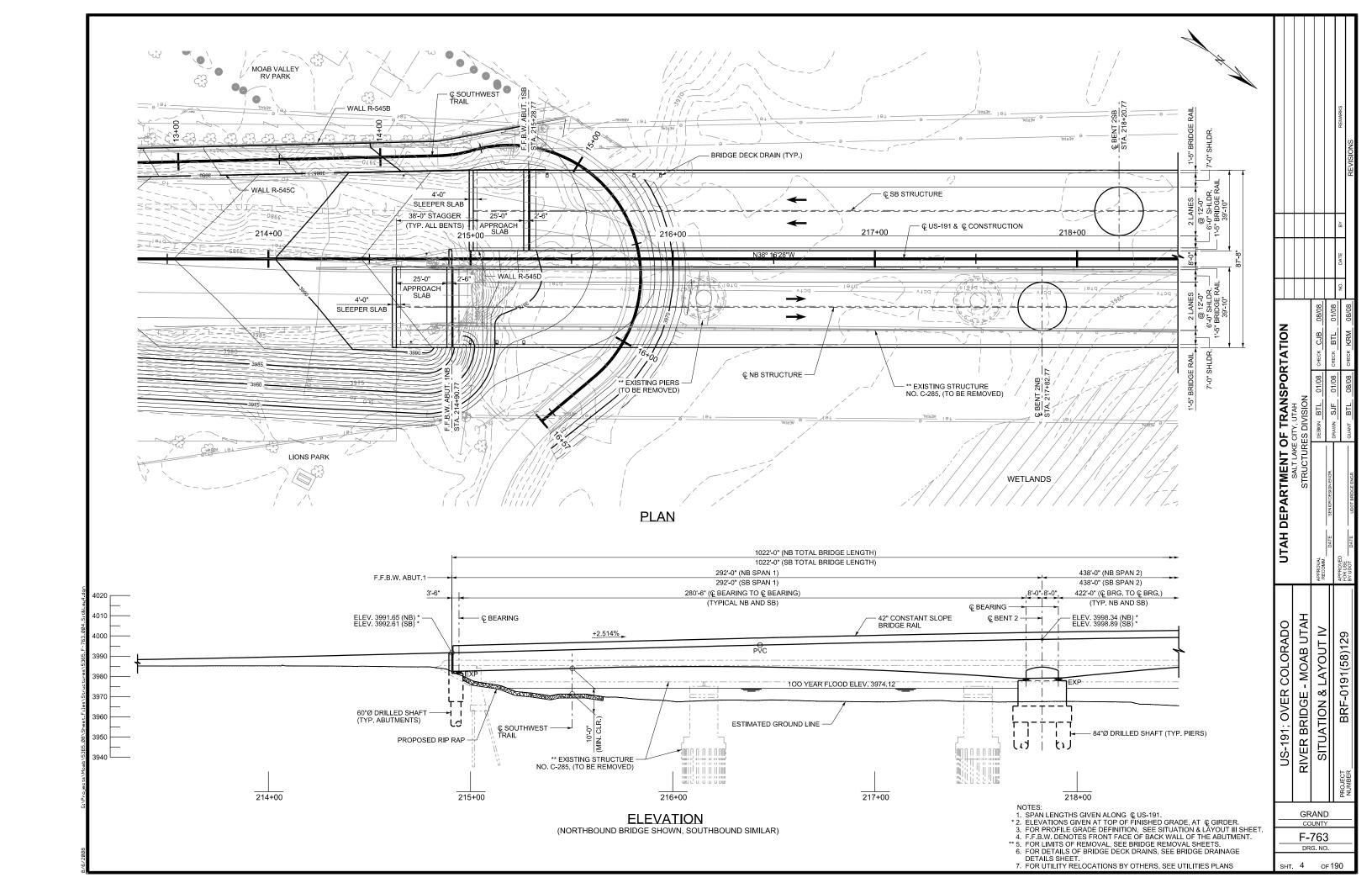
ABUTMENTS: RIP RAP PROTECTION PROVIDED

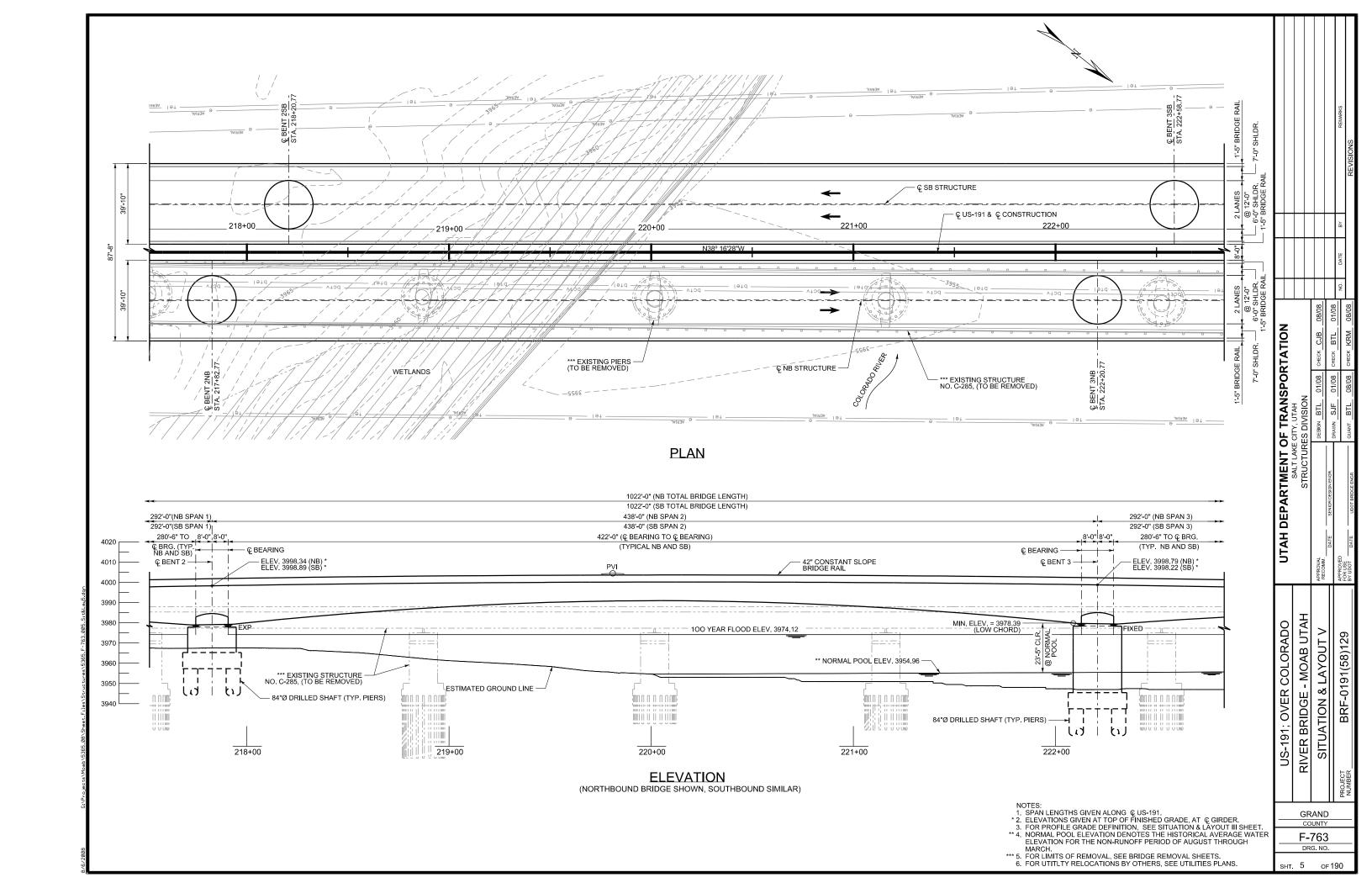
H. MISCELLANEOUS:

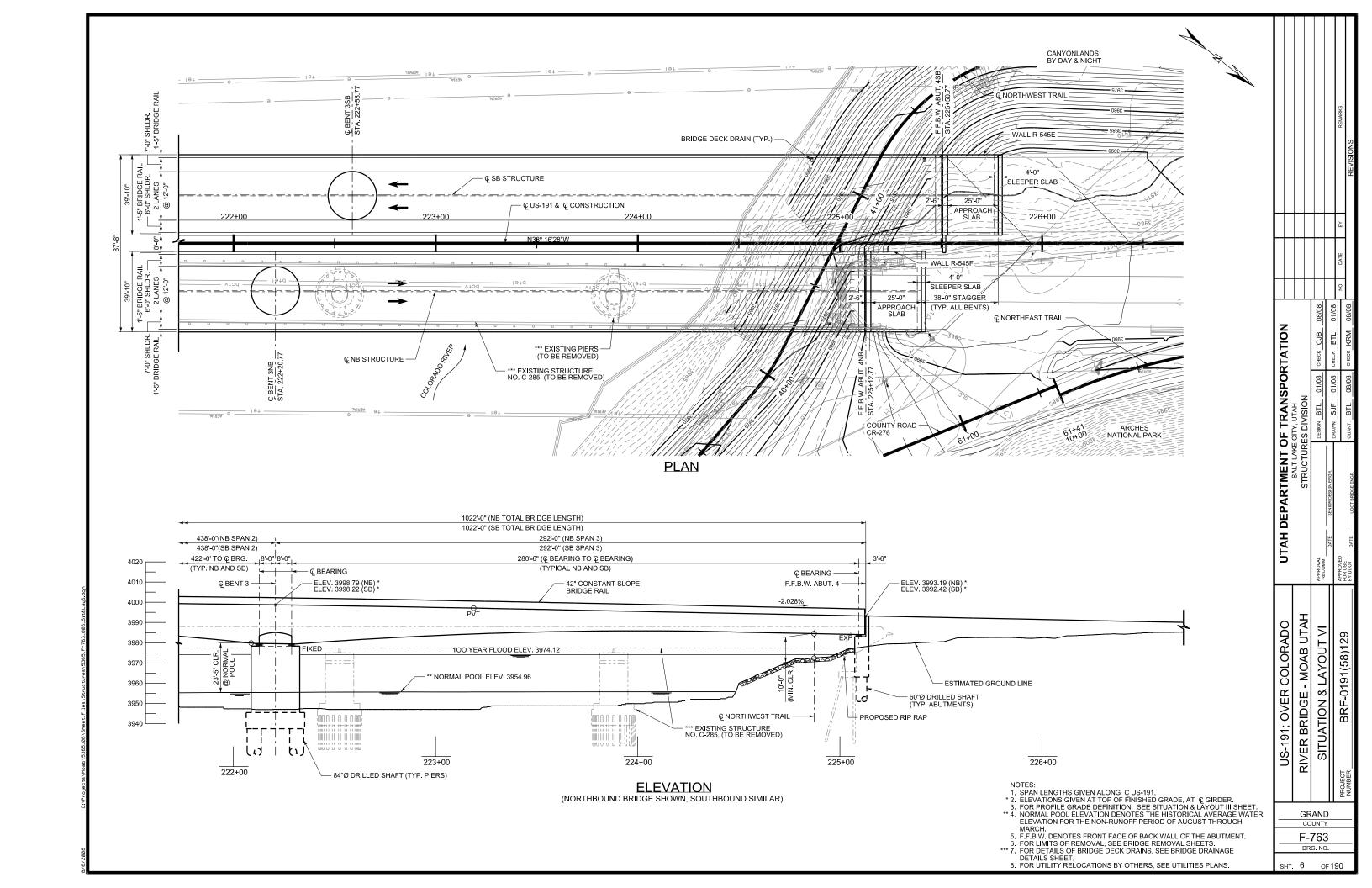
- 1. PROVISIONS HAVE BEEN MADE FOR JACKING OF THE SUPERSTRUCTURE FOR REPLACEMENT OF THE BEARINGS
- 2. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING
- 3. PERMANENT STEEL DECK FORMS ARE NOT ALLOWED.
- 4. PERMANENT CONCRETE DECK FORMS ARE NOT ALLOWED.
- 5. THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AND FOR AVOIDING DAMAGE THERETO.
- 6. DATUM SEE SURVEY CONTROL DRAWING

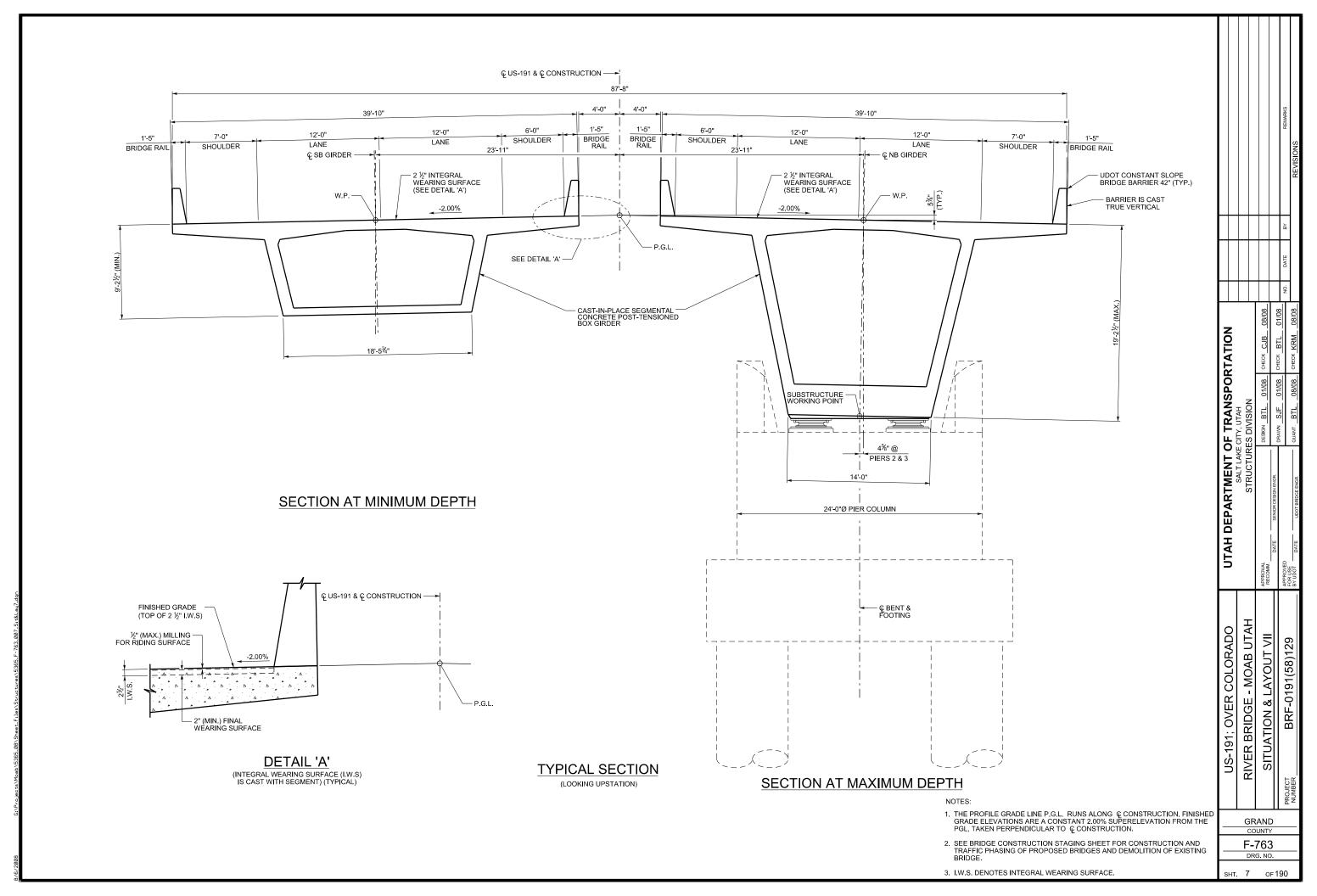
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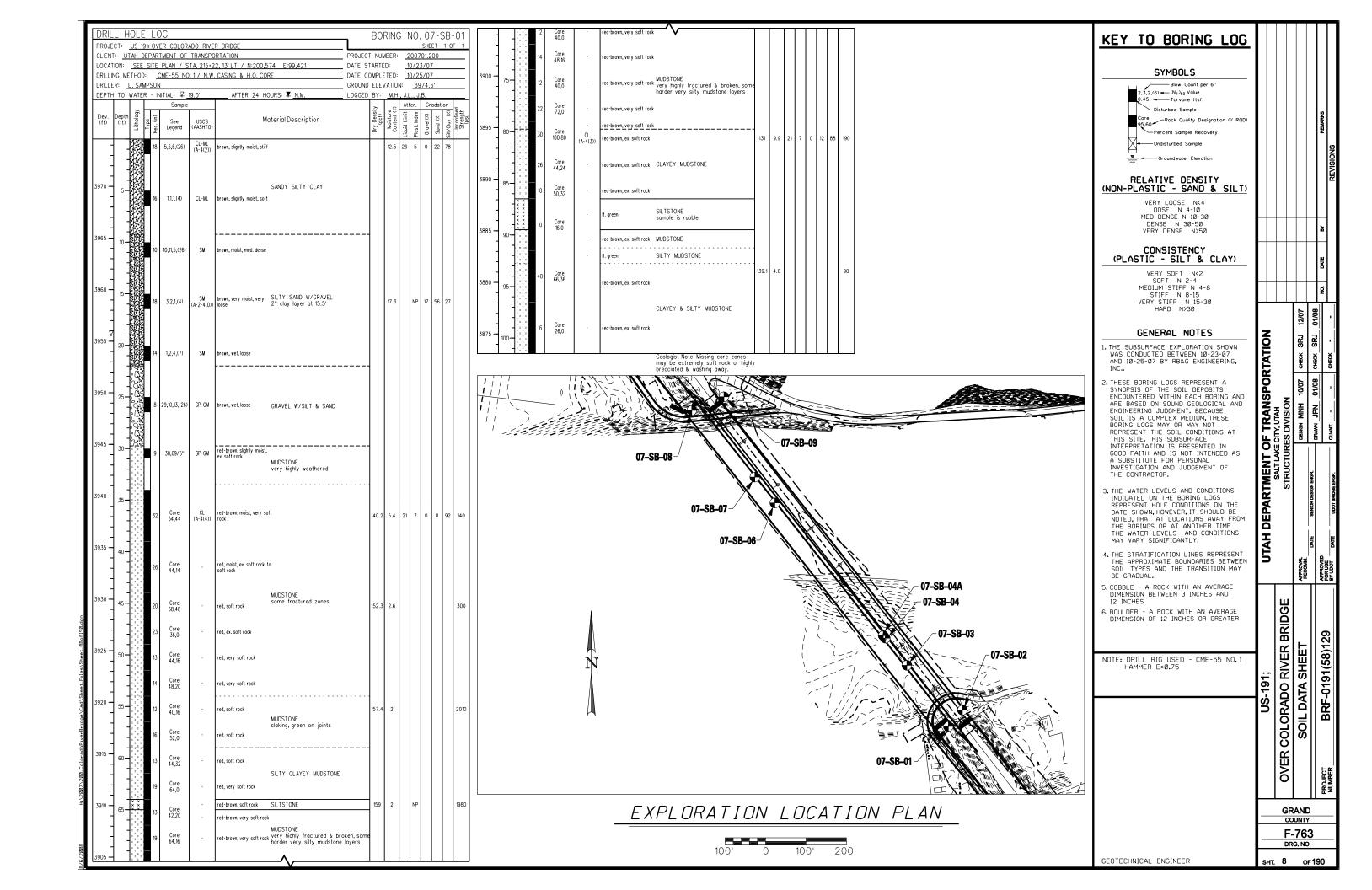




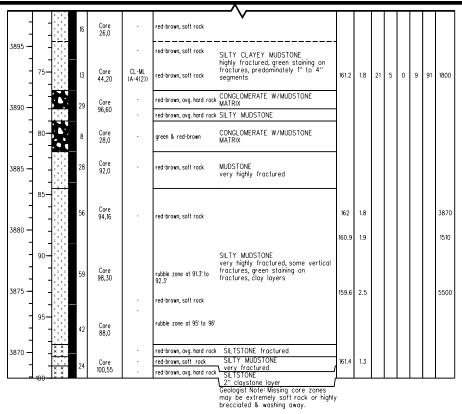




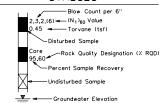




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eet.	.	50-	7:77				green, ex. soft rock —	CLAYSTONE		1								
s\SI	1 -	-		30	Core	C1 - M	nurale to rad-b	SILTY CLAYEY MUDSTONE										
File		1 -		JU	50,0	(A-4(2))	purple to red-brown, very soft rock	very highly fractured		156.3	3.2	20	5	0	6	94		
eet	3915 -	1 -																
4)S]																
H:\2007\200_ColoradoRiverBridge\Cad\Sheet_Files\Sheet_09of190.dgn	:	55-			_			SILTY CLAYEY MUDSTONE										
r1dg	1 -	.		44	Core 74,0	CL-ML (A-4(3))	red-brown, soft rock	very highly fractured, green on fractures	staining		2.6	20	6	0	9	91		
ver	3910 -	- ا						J. 11 00 (d) 03										
doRı	1 -	-	إجبا				 -			-								
lore	.	60-																
Ø.Cc	1 -	1 -		30	Core	_	red-brown, soft rock											
7\20	7005	1 -		•	50,0		.,	On TV 1010 0 TO 10										
1200	3905 -] -]::::]					SILTY MUDSTONE very highly fractured, some	vertical									
Ï	.	65-			Core			fractures, green staining on fractures, predominately 0.5	" to 4"									
	.	۔ ۔ ّ` ا		0	0,0	-		segments, very soft & highly fractured material washing a	/									
	-	-			_				,									
۵	3900 -	-		30	Core 100,0	-	red-brown, soft rock											
/6/2008	-	1 -						•										
/9/							I					_				Ш		



SYMBOLS



RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4 LOOSE N 4-10 MED DENSE N 10-30 DENSE N 30-50 VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2 SOFT N 2-4 MEDIUM STIFF N 4-8 STIFF N 8-15 VERY STIFF N 15-30 HARD N>30

GENERAL NOTES

- 1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 10-26-07 AND 10-31-07 BY RB&G ENGINEERING, INC..
- 2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
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- 4. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY RE GRADUIAL.
- 5. COBBLE A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
- 6. BOULDER A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

NOTE: DRILL RIG USED - CME-55 NO.1 HAMMER E=0.75

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Ó		SRJ	9	3		•	
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ANS	SION	HNH	Ž	NL			
FTR	IN YIIS	DESIGN	1001000	DEAWN		QUANT	
UTAH DEPARTMENT OF TRANSPORTATION	SALT LAKE CITY, UTAH STRUCTURES DIVISION		SENIOR DESIGN ENGR.			UDOT BRIDGE ENGR.	
UTAH		APPROVAL RECOMM.	DATE	DEBOVED	OR USE	BY UDOT DATE	
US-191;	OVER COLORADO RIVER BRIDGE	SOIL DATA SHEET			PROJECT BRF-0191(58)129 F	2=:/22): 2:2	
	GR	ANE)			_	
	F-	-76 g. nc	3			_	
SHT.	9	0	F1	90)		

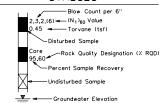
	CT:		191;	OVE	R COLOR					RING			SHE	ΕT		F 1
					MENT OF PLAN / S			PROJEC DATE S				2 <u>007</u> 1/21	<u>01.2</u> /07	00		
RILLI	NG M	ЕТНО	D:	<u>C</u>	ME-55 NO		CASING & N.Q. CORE	ATE C	OMPLE	ETED:	1	1/28	/07			_
		D. SA			ITIAL: ♀_	12 3'		GROUND OGGED					67.1		NF	_
/LF 11	. 10		Ĺ	iiN	Sample		ALIEN 27 HOUNS ÷ 12.3 L	.JUUED	_	_		ter.		odati	ion	p
Elev. (ft)	Depti (ft)	Lithology	Type	Rec. (in)	See Legend	USCS (AASHTO)	Material Description		Dry Densit (pcf)	Moisture Content (%	Liquid Limit	Plast. Index	Gravel (%)	Sand (%)	Sit/Cloy (2)	Unconfined Strength
- 965 -				10	4,5,6,(23)	ML	lt. brown, slightly moist, med. dense									
-	5-			14	2,4,4,(17)	ML	brown, slightly moist, loose SANDY SILT									
- 960 –				12	3,3,3,(12)	ML (A-4(0))	brown, slightly moist, loose			11		ΝP	6	41	53	
-	10-			15	10,9,8,(29)	SM	brown, moist, med. dense SILTY SAND									
- 955 5 -	Y			9	6,10,6,(24)	SM	SILTT SAND									
-	15-			6	2,2,1,(4)	SP-SM	brown, wet, very loose									
950 - -				10	10,11,9,(27)	SP-SM	SAND W/SILT brown, wet, med. dense									
- - 945 –	20-				wp.gwp477											
-	25-			9	25,21,16,(46)	GP-GM	brown & block, wet, med. GRAVEL W/SAND & SILT possible cobbles									
40 -							·									
-	30-	_		6	64/6" Core	SM (A-1-b(0))	gray & brown, very soft rock SILTY SANDSTONE fractured, black oxide stain or controlled fractured.	n		15.7		NP	37	43	20	
- 935 - -		-		36	75,13 Core	-	gray & red bands U. Name QUANTITIZED SILTSTONE									
-	35-			56 56	94,48 Core	-	CONGLOMERATE	ONE								
930 - - -		-/// -/// -			94,48		CLAYSTONE purple-brown, ex. soft rock very highly weathered		129.9	11.8						224
- - 925 -	40-	- :::: - :::: - ::::		60	Core 100,58	-	red-brown, soft rock									
-	45-	- :::: -:::: -::::		60	Core		green & brown MUDSTONE breaks when handled		148	4.2		ΝP				790
- 200 		-		υU	100,80											
-	50-	-/// -		54	Core 90,52	-	blue-gray to purple-gray, CLAYSTONE red-brown, very soft rock to									
915 - - -		- :::: - ::::				-	red-brown, soft rock									
- - 910 –	55-			58	Core 96,44	-	3" septorion nodule MUDSTONE red-brown, soft rock									
-	60-				Core	-	red-brown, soft rock		147.1	4.8						1710
- - 905 -		Ä		58	96,69	-	It. brown & brown, avg. CONGLOMERATE W/MUDSTONE hard rock CLASTS & MUDSTONE GRAVEI	_S								
-	65-	-		56	Core 94,60		brown w/lt. brown & greenMUDSTONE layers, soft rock CONGLOMERATE									
- 000 		 F4				-	brown w/green layers, soft MUDSTONE very It. brown, avg. hard CONGLOMERATE		100.5							1000
	I	N.	1	19	Core	-	rock highly fractured		162.2	1.1	ı	ı	ıl			1200

						Λ							
3895			19	Core 32,8	-	red-brown, very soft rock CLAYSTONE W/extremely soft layers							
	75-		10	Core 32,0	-	red-brown, very soft rock							
	_			C		red-brown, very soft rock							
3890	-	-	18	Core 60,50	-	red-brown to brown w/green spots & layers, very soft rock	143.6	7.2					
3885	80-		43	Core 72,12	-	red-brown to brown w/green spots & layers, very soft rock SHALEY MUDSTONE very fractured, breaks easily when handled, unable to run unconfined compression strength tests							
3880	- 85-		40	Core 66,9	GP-GM (A-1-a(0))	red-brown to brown w/green spots & layers, very soft rock	153.7	5.2	ΝP	67	24	9	
	1	× × × × × × × × × × × × × × × × × × ×			-	green-gray, avg. hard rock SILTSTONE claystone inclusions							
	90-	-	53	Core 88,24	-	red-brown w/green layers,MUDSTONE soft rock rusty coating on fractures							
3875]	K			-	gray, avg. hard rock							
3870	95-	22.23	30	Core 50,40	-	gray, ovg. hard rock CONGLOMERATE very highly fractured, rusty staining on fractures, some zones missing	162.5	3.1					12,110
	100-		8	Core 28,0	-	gray, avg. hard rock							
3865	-	- × × × × × × × × × × × × × × × × × × ×	17	Core 56,0	-	green, avg. hard rock SILTSTONE soft claystone layers							
	105-	-	29	Core 98,64	-	red-brown w/green layers, MUDSTONE very soft rock	142.3	7.4					480

Geologist Note: Missing core zones may be extremely soft rock or highly brecciated & washing away.

KEY TO BORING LOG

SYMBOLS



RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4 LOOSE N 4-10 MED DENSE N 10-30 DENSE N 30-50 VERY DENSE N>50

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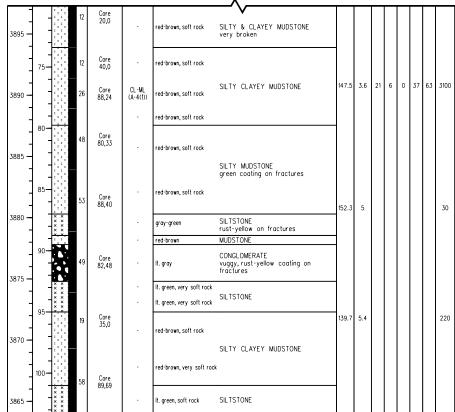
GENERAL NOTES

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- 2. THESE BORING LOGS REPRESENT A
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NOTE: DRILL RIG USED - CME-55 NO.1 HAMMER E=0.75

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S		SR.	9	3		.	
¥		ECK .	2	5		CHECK	
RT,		₹	7	5	Ľ	5	
8		DESIGN DS 11/07 CHECK SRJ	90/10	DRAWN JPIN 01/00 CHECK OLD			
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[≥	Y OTA	e G	1	2		QUANT	
<u>፟</u>	ESI	DESI		5		Š	
UTAH DEPARTMENT OF TRANSPORTATION	SALT LAKE CITY, UTAH STRUCTURES DIVISION		SENIOR DESIGN ENGR.			UDOT BRIDGE ENGR.	
H.					DATE		
5		APPROVAL RECOMM.	I	PPROVED	FOR USE	Y UDOT	
US-191;	OVER COLORADO RIVER BRIDGE	SOIL DATA SHEET			PROJECT BRF-0191(58)129		
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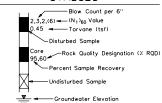
DRIL	L	HOL	E	L()G					BOF	RING	N						
I I					ER COLOR				DD0 /50		1050	_				1 0	F 1	3895
LOCAT	_				TMENT OF PLAN / S			2 E:99,265	PROJECT	i nui Tarte	D: NRFK:		1/19.		:00			
DRILLI							CASING & N.Q. COF						1/21					
DRILLE		D. SA							GROUND					67.				
DEPTH	1 10	WAIE	T	- IN	IITIAL: ♀ <u>·</u> Sample		AFTER 24 HC	DURS: ¥ <u>N.M.</u>	LOGGED			۸.,	EN, er.		<u>oon</u> adati		_	3890
Elev.	Dep	h 60	П	٦	00			ata dal Dana dallar		ensity (f)	t (S)	_		-	_	8	fined igth	
(ft)	(ft	Lithology	Type	Rec. (in)	See Legend	USCS (AASHTO)	Mo	aterial Description		Dry Density (pcf)	Moisture Content (7)	iquid Limit	Plast. Index	Gravel (%)	Sand (%)	Silt/Clay	Unconfined Strength (psi)	
<u> </u>	┝	S-N-O		_			It. brown, slightly moist,			_	<u> </u>	:3	Pk	٥	S	Silt		
-	ł			12	3,5,4,(19)	SM	loose	SILTY SAND organics near surface										3885 -
3965 -	ł		Ш							-								
	1	-11		11	3,2,2,(9)	ML	lt. brown, slightly moist, very loose											
-	5	-11	П					SANDY SILT occasional clay lenses										
-	ł]]]		12	3,2,4,(12)	ML	It. brown, slightly moist,	,										3880
3960 -	t	-					loose			ł								
-		- (1)			40.47.40.450	SM	It. brown, slightly moist to				l			l	_			
-	10			12	10,13,16,(50)	(A-2-4(0))	moist, med. dense				12.6		NΡ	11	77	12		
-	ł		Ш					SILTY SAND										3875
3955 -		-		9	6,8,7,(22)	SM	brown, wet, med. dense											
-	١.																	
-	15]]		11	6,13,17,(42)	GP-GM	brown, wet, med. dense											
3950 –	1	-04.0																3870 -
-	-																	
-	20																	
] 20			10	19,16,10,(34)	GP-GM	brown, wet, loose	GRAVEL W/SILT & SAND										
3945 —		-00						ORAVEE WYSIET & SAND										3865 -
-	ł																	
-	25																	
	1			12	22,31,40,(87)	GP-GM (A-1-a(0))	brown, wet, dense				7.4		NΡ	53	40	7		
3940 —	ļ	000																
-	ł	100								1								
	30	-		4	56/4"	SC-SM	red & gray-purple	CILITY OF AVEY MUDGIONE										
-	ļ	-:::			Core	SC-SM	, , , ,	SILTY CLAYEY MUDSTONE very highly fractured & broken	ken									
3935 -	ł			18	55,0	(A-1-b(0))	red & purple, soft rock				3.7	17	5	31	57	12		
-	t]::																
-	35	-:::			Coro	ML	red & purple, soft rock	SILTY MUDSTONE			8.5	18	3	0	44	56	245	
-	ł	-:::		24	Core 40,0	(A-4(0))	red & purple, sort rock	SIETT WODSTONE			0.5	10	,	ľ	77	50	243	
3930 —	ł							CONGLOMERATE W/MUDSTON	ΙE									
	1		I		Core			-MATRIX		İ								
-	40	-:::		26	88,52	-	red-brown, soft rock			128.7	8							
-	1]:::		10	Core		and beauty of the state of the											
3925 -	1	-		18	60,0		red-brown, soft rock											
-	1	-		17	Core 82,38	-	red-brown, soft rock	CLAYEY MUDSTONE TO										
-	45	10			02,00			CLAYSTONE highly fractured, several zone	es of									
7000	1]:::		18	Core 45,27	-	red-brown, soft rock	missing core, slaking										
3920 -]	-			-,=,													
-	1	-:::																
-	50]::		34	Core	-	red-brown, soft rock			141.2	7.7						410	
3915 -	1	- :::		٠,	56,8													
]]] -	1	1					It. brown, avg. hard rock	CONGLOMERATE vuggy, open fractures w/blac	ck oxide	1								
-	ł.,	11/1	7					staining		1								
-	55			11	Core 18,8													
3910 —		-///	1		10,0		red-brown, very soft rock	CLAYSTONE										
	1																	
-	60		Į			-	brown, avg. hard rock	CONGLOMERATE _broken zone										
] ຶ	-1/1		28	Core 46,0		l											
3905 —	1				.0,0	-	red-brown	CLAYSTONE										
-	1							less broken than above										
-	65		4				red-brown gray-green, avg, hard roc	KSII TSTONE										
	1	-	۱	49	Core 82,50	C1 1.	, ay groom, urg, nuru 100	USE TO TOME		1								
3900 —	1	-				CL-ML (A-4(0))	red-brown, soft rock	SILTY & CLAYEY MUDSTONE		139.8	7.1	19	5	1	44	55	200	
	1	××					It. brown	SILTSTONE										
	1_	10																



Geologist Note: Missing core zones may be extremely soft rock or highly brecciated & washing away.

KEY TO BORING LOG

SYMBOLS



RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4 LOOSE N 4-10 MED DENSE N 10-30 DENSE N 30-50 VERY DENSE N>50

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NOTE: DRILL RIG USED - CME-55 NO.1 HAMMER E=0.75

GEOTECHNICAL ENGINEER

JE TRANSPOR	SALT LAKE CITY, UTAH STRUCTURES DIVISION	DESIGN MNH 11/07	AUTO INGI INGI	DEAMIN JEIN 01/00	!	GUANT	
UTAH DEPARTMENT OF TRANSPOR	SALI LAKE STRUCTUR		SENIOR DESIGN ENGR.			UDOT BRIDGE ENGR.	
UTAH		APPROVAL RECOMM.	DATE	UEMORED	FOR USE	BY UDOT DATE	
US-191;	OVER COLORADO RIVER BRIDGE	SOIL DATA SHEET			PROJECT BRF-0191(58)129		
	GR	ANE					
	F-	76 g. nc	3			_	
SHT.	11	0	F1	90)		

STATION

DRILL	Н	OLE	LO	G			E	ORING	NO. (07-SI	B-04.	А		///_	7. Co	re	_	hlue-gray yery soft clay to	CLAY TO CLAYSTONE clay & silt seams & layers both		op	П		_
PROJEC						ER BRIDGE				SHEET	1 OF		3865 -	1 1//	34 Co	12		soft rock	vertical & horizontal, possible fault gouge (?), very weathered (?)					
						ORTATION		T NUMBER		701.200)	-		1,,, 1				red-brown, ext. Soft rock L	godge 1.7, very weathered 1.7					
OCATIO		SEE THOD:		<u>PLAN / :</u> ME-55 N		7+98, ~1'LT. / N:~200,798 E:~99,260		TARTED:		6/08 4/08		-	:		46 Co	re zc	-	red-brown, ext. soft rock	CLAYSTONE					
RILLER		D. SAMI		ME-SS IN	J. I / H	J. CORE		OMPLETE() ELEVATI		4708 8968.0'		-	7000	<i>- </i>	/0,	30			silty mudstone layers, some layers softer than others					
	_			TIAL: ∑	12 7'	AFTER 24 HOURS: ▼ N.M.) BY: <u>M.</u>)NF	-	3860 -				CL		sorter than others					
<u> </u>	10	I		Sample	!	74 TEN 21 1100N3 - 110M		, <u>, , , , , , , , , , , , , , , , , , </u>	Atter.	Grade	ntion	_	.	110-	n Co	re	(A-4)	red-brown, ext. soft rock		9.7	20 7			
lev.)enth	66	2			1		ure transity	≶ 	\$ 8 5	C: O	£.			32	,0		red-brown	MUDSTONE RUBBLE IN CLAY					
(ft)	epth (ft)	Lithology	i (i	See Legend	USCS (AASHT	Material Description		Dry Density (pcf) Moisture	Liquid Limil	Gravel (Silt/Clay (X) Unconfined	Stre	3855 -	- 7			-	blue-gray, very soft rock	1					
			2	Logono				ک ک	Liquid	3 3	S III		:	115				aray-areen ext soft to ver	CLAYSTONE					136
7	_													- 7//	50 Co	re 84	-	soft rock	red-brown mudstone inclusions					54
965	-												3850 -						Change To Paradox Formation					
""]	_					SILTY SAND								→			•	lt. gray, very soft rock to soft rock	GYPSUM W/MUDSTONE					
	5-													120	55 Co	re		green-gray, very soft rock						82
7	-												l		92,	⁷⁰	-	di sana anno anti-anti-						
960 🚽	-					,		4					3845 -					dk. gray, very soft rock	SILTY CLAYSTONE brecciated fragments/inclusions,					
4	10-					SILTY SAND W/GF	AVEL						.	125-125	ne Co	re		dk. gray, very stiff clay to	mudstone fragments					
	-	7						1							26 44	,8		very soft rock						
955 🛂	_												3840 -				GP ⁻ GM	-						
	15—	23												1 ₁₃₀		((A-1-a(0))	gray, avg. hard rock		6.6	NP	71	21 8	
4	-												.		19 Co	re ,0		gray, avg. hard rock	BRECCIATED SILTSTONE					
950 🕇	-												3835 -]]					very highly fractured, all broken with no whole pieces, missing core					
٦٠٠ - ١	-	99				GRAVEL W/SILT &	CAND												possible extremely soft rock					
1	20-	[•¢•]				GRAVEL W/SILT &	טוווט						:] ISS] × × ×	48 Co	re	-	gray, avg. hard rock			П			
7	-												707-		46 80	٥,		block ware self cost	CLAYSTONE		H			
945	-	643											3830 -				-	black, very soft rock	pyrite_crystals, thin_gypsum_lenses		П			
7	25-	ďΫ				Note: See Boring (17-SB-04 for							140-	48 Co	re		aray aya basal sool door			H			
- 1	-					detailed descriptio	ns & properties								48 80	12	•	gray, avg. hard rock to sof rock	brecciated clay layers to 3.5" thick					
940	_	9.0				of soil above eleva	tion 3940'.	4					3825 -	///			CL							
- 1	70		-											145			(A-4)			7.2	22 7			
7	JU -		16	Core 30,0	Ι.	red & purple gray, soft rock SILTY CLAYEY MU	DSTONE							- 199	50 Co	re 50	-	gray, ext. soft rock						
,, <u>,</u>	-		10	30,0		very fractured, sor	ie rubbie, vertict						3820 -											
935	_			Core		1	illing on mocture.	1						12	48 Co 80,	re ZA		gray, ext. soft rock to avg. hard rock						
	35—		10	32,0	-	red-brown, soft rock							:	150								11		
7	-		24	Core	١.	red-brown, soft rock		1							48 Co	34	•	gray, ext. sort rock to avg. hard rock	SILTY CLAYSTONE TO CLAYSTONE					
930 🗕	-			80,35		SILTY MUDSTONE							3815 -						brecciated layers, vertical &					
7	40-		34	Core 112,43	-	red-brown, soft rock fractured zones, n than above	ore competent						.	- 155- <i>(///)</i>	EE Co	,		gray, ext. soft rock to avg.	horizontal fractures, layers of varying hardness					
4	-			Core										1 1/2	55 92	26	-	hard rock						
925	-	::::	29	96,32	1:	red-brown, soft rock		4					3810 -	- 1//										3169
-						-green-gray, avg. hard rockMUDSTONE		1						160										
1	45-		60	Core	١.	red-brown, soft rock SILTY MUDSTONE								- 100	13 Co	re 0	-	gray, ext. soft rock to avg. hard rock						
+	-			100,60								113	3805 -		"	,								
920 🕇	_	33	50	Core	Ι.	green-gray, avg. hard rock		1					15005	: : :				dk. gray, soft rock	MUDSTONE					
4	50-		33	98,50		CONGLOMERATE		1			11.			165	52 Co	re	CL-ML (A-4)	black, very soft rock	SILTY CLAYSTONE pyrite crystals, clayey rubble	8.3	19 4			
1	=	34	59	Core 98,50	-	green-gray ava hard rock siltstone matrix w.					4	4113		- 122	32 86,	24	-	gray, ext. soft rock to avg.						
915	-	\mathbf{q}		30,30		fragments, mudston	seams & layers						3800 -					hard rock						
1	55-				:	green-gray, avg. hard rock red-brown, ext. soft rock LEAN CLAY		1			5	573	-	170-1/2	. Co	re l		gray, ext. soft rock to avg.						
\dashv	-	::::	56	Core 94,56	-	red-brown, avg. hard rock MUDSTONE		1					1 :	j 1///	54 98	15	-	hard rock						
5910	-	O			-	green-gray, avg. hard rock extremely soft lay	#1 S	1			2	2315	3795 -								H			
4	-	97.00			٠.	siltstone matrix, m	udstone seams	1					:	1 ₁₇₅ 1//							H			
1	ьо -		25	Core 46,11	CL	red-brown, ext. soft rock		11.6	5 23 7				-	- 7//	62 Co	re 44	-	gray, ext. soft rock to avg. hard rock			H			
,,, 	-			70,11	(A-4)	CLAYSTONE							3790 -		"				011 711 01 1110 7 111		H			
905	-			Core		very highly fractu	ed, horizontal&						3,30	<i>\istoria</i>			CL-ML (A-4)		SILTY CLAYSTONE very highly fractured with both	4.2	24 5			
4	65-		23	76,0	'	red-brown, ext. soft rock vertical fractures] :	180	46 Co	re	17	gray, ext. soft rock to avg.	vertical & horizontal fractures, brecciated layers, clay seams, rubble		H			169
1	-		23	Core	-	red-brown, ext. soft rock							L	- 100	76,	52		hard rock	zones, layers of varying hardness		H			.03
900 -	-	(1 j. j.)	23	76,16	-	green, soft rock MUDSTONE		1					3785 -								П			
1	70-		19	Core 64,16	:	red-brown, ext. soft rock							1	185	r	,,		gray, ext. soft rock to avg.			П			
4	-												:		53 Co	38	-	gray, ext. sort rock to avg. hard rock			П			
895	=		17	Core 56,0	.	red-brown, ext. soft rock CLAYSTONE							3780 -								П			1
4	- -		14	Core	١.	some zones more red-brown, ext. soft rock others	tractured than] :	190							П			79
1	/5-		"	48,0	`	Too brown, CAC SOIL FOCK									44 Co	re 34	-	gray, ext. soft rock to avg. hard rock			П			
,,, 	-		22	Core 72,24		red-brown, ext. soft rock					2	235	3775 -		'"	·					П			
390 🕇	-			12,24	١.	red-brown, soft rock] ,,,,,,,,,,	<u> </u>			GM			6.4	ND.	, ,	18 20	
4	80-	× × :		Core	-	green, avg. hard rock SILTSTONE	-	1					1 '	195	40 Co	re i	(A-1-b(0)) -	gray, ext. soft rock to avg.	SILTSTONE	0.4		02	10 ZU	
1	-		41	68,18		red-brown, soft rock								-	40 66	,9		hard rock			П			
885	-					MUDSTONE very highly fractu	ed						3770 -	1/2/2	,, Co	,,	-	gray to dk aray and acti	SILTY CLAYSTONE		П			
	85 -				.	red-brown, soft rock							:		31 52	,ŏ	-	gray to dk. gray, ext. soft rock to avg. hard rock	very highly fractured with both		H			
7	-		53	Core 88,13		-gray-green							1		31 Co	re		gray to dk. gray, ext. soft	vertical & horizontal fractures, brecciated layers, rubble zones,		П			
١. ٩	-	***		50,13	:	gray-green to red-brown SILTY MUDSTONE	V CENIC						3765 -		52	,0	-	rock to avg. hard rock	layers of varying hardness		П			
880 🕇	_	ر پرچر			١.	gray, avg. hard rock CONGLOMERATIC S	ILTSTONE	<u>'</u>					2.00	Y 5/ X				(eologist Note: Missing core zones					
\dashv	90-	W		Core	:	-blue-gray, stiff clay clay seams to 0.5 blue-gray, avg. hard rock CLAYSTONE	" thick	1			.							r t	nay be extremely soft rock or highly recciated & washing away.					
1	_	97.90	bU	100,76	.	conglomerate	adar::	1 1			6	685							•					
375	-				-	rock very highly fractu	ea, vuqqy	1																
- 1	OE -				(A-4)	red-brown, stiff clay to soft CLAYSTONE		9.3	22 7															
- 4			- 1	Core 60,20	I "" "	rock clay & silt layers,	fractured	1 1	1 1	1 1		- 1												

SYMBOLS

2,3,2,(6) — (N₁)₆₀ value 0.45 — Torvane (tsf) 3,2,(6) - (N₁)₆₀ Value ─Rock Quality Designation (% RQD) -Percent Sample Recovery -Undisturbed Sample Groundwater Elevation

RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4 LOOSE N 4-10 MED DENSE N 10-30 DENSE N 30-50 VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2 SOFT N 2-4 MEDIUM STIFF N 4-8 STIFF N 8-15 VERY STIFF N 15-30 HARD N>30

GENERAL NOTES

- 1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 00-00-08 AND 00-00-08 BY RB&G ENGINEERING, INC..
- 2. THESE BORING LOGS REPRESENT A
 SYNOPSIS OF THE SOIL DEPOSITS
 ENCOUNTERED WITHIN EACH BORING AND
 ARE BASED ON SOUND GEOLOGICAL AND
 ENGINEERING JUDGMENT, BECAUSE
 SOIL IS A COMPLEX MEDIUM, THESE
 BORING LOGS MAY OR MAY NOT
 REPRESENT THE SOIL CONDITIONS AT
 THIS SITE. THIS SUBSURFACE
 INTERPRETATION IS PRESENTED IN
 GOOD FAITH AND IS NOT INTENDED AS GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTROLLOR THE CONTRACTOR.
- 3. THE WATER LEVELS AND CONDITIONS INDICATED ON THE BORING LOOS REPRESENT HOLE CONDITIONS ON THE DATE SHOWN, HOWEVER, IT SHOULD BE NOTED, THAT AT LOCATIONS AWAY FROM THE BORINGS OR AT ANOTHER TIME THE WATER LEVELS AND CONDITIONS MAY VARY SIGNIFICANTLY.
- 4. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
- 5. COBBLE A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
- 6. BOULDER A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

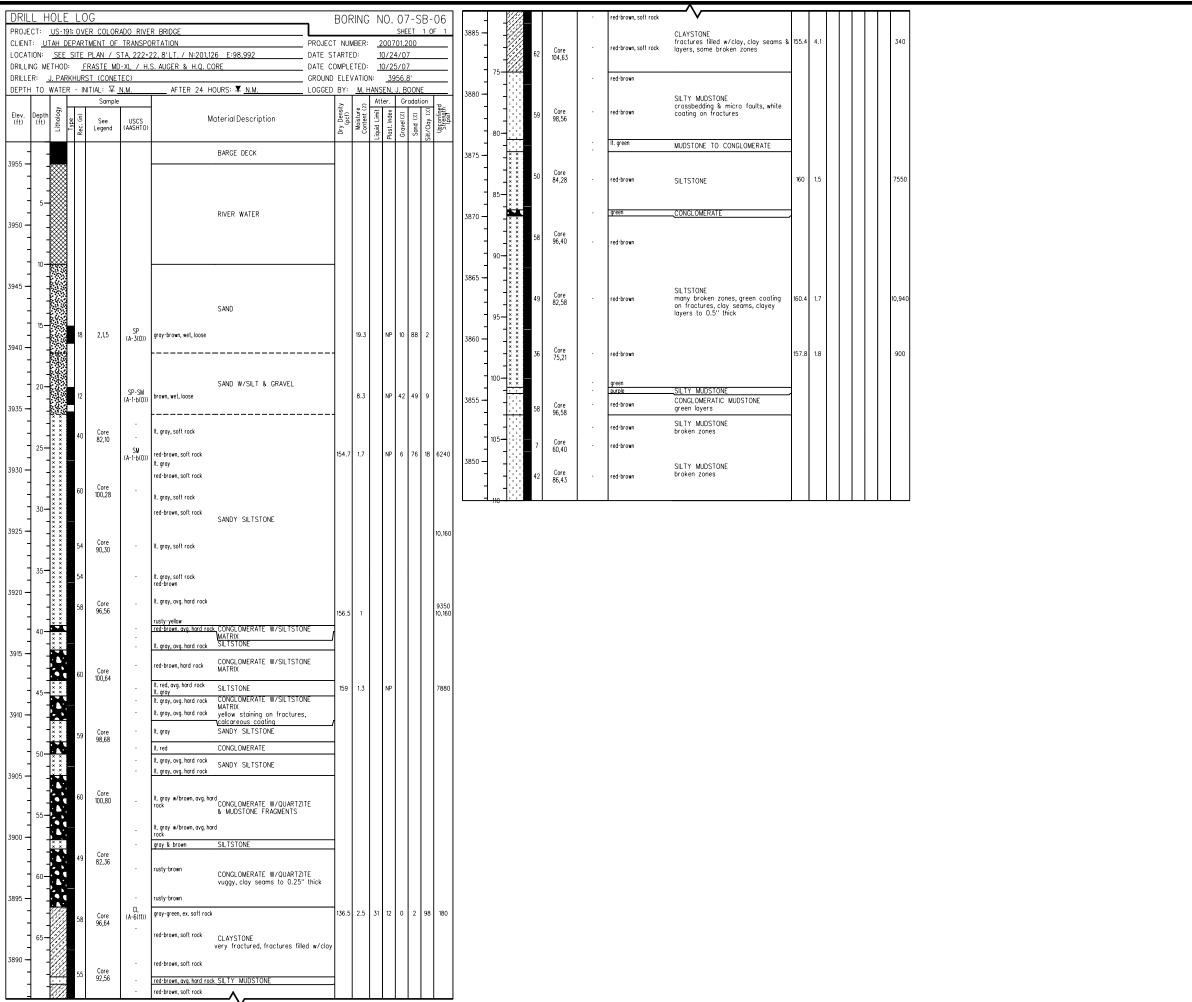
NOTE: DRILL RIG USED - CME-55 NO.1 HAMMER E=0.75

01/08 CHECK SRJ (UTAH DEPARTMENT OF TRANSPORTATION SALTURE CITY, UTAH STRUCTURES DIVISION ES DIVISION DESIGN MNH 01/08 C OVER COLORADO RIVER BRIDGE SOIL DATA SHEET NUMBER NUMBER

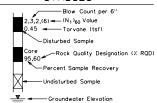
GRAND COUNTY F-763

DRG. NO. SHT. 12 OF 190

US-191;



SYMBOLS



RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4 LOOSE N 4-10 MED DENSE N 10-30 DENSE N 30-50 VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2 SOFT N 2-4 MEDIUM STIFF N 4-8 STIFF N 8-15 VERY STIFF N 15-30 HARD N>30

GENERAL NOTES

1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 10-24-07 AND 10-25-07 BY RB&G ENGINEERING, INC..

ORTATION

PARTMENT OF TRANSP SALTLAKE CITY, UTAH STRUCTURES DIVISION

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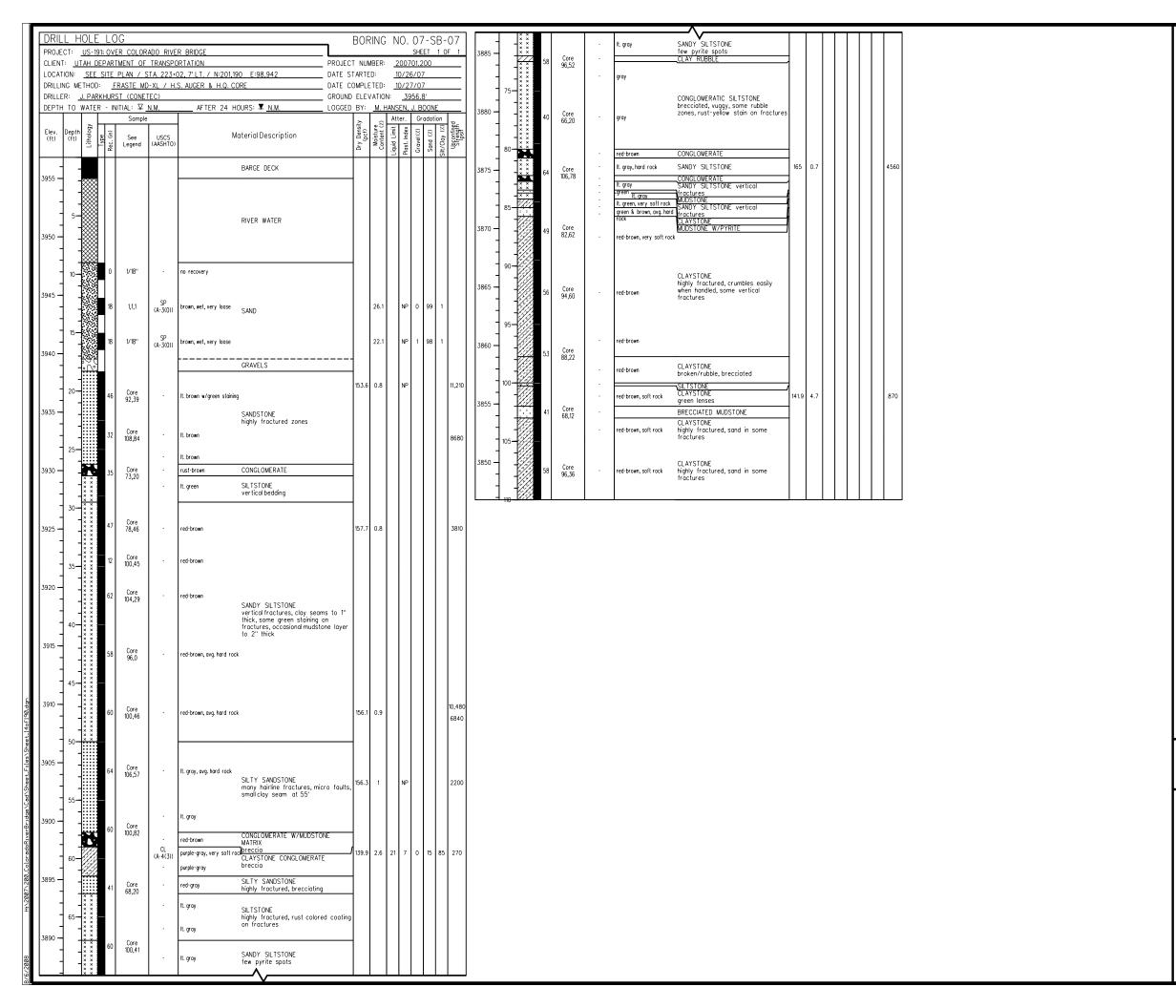
- 2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
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NOTE: DRILL RIG USED - FRASTE MD-XL

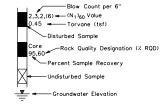
GEOTECHNICAL ENGINEER

		APPRO	APPRO FOR US BY UDC	
US-191;	OVER COLORADO RIVER BRIDGE	SOIL DATA SHEET	PROJECT BRF-0191(58)129	
_		AND		
		- 763 g. no.	<u> </u>	

sнт, 13 ог 190



SYMBOLS



RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4 LOOSE N 4-10 MED DENSE N 10-30 DENSE N 30-50 VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2 SOFT N 2-4 MEDIUM STIFF N 4-8 STIFF N 8-15 VERY STIFF N 15-30 HARD N>30

GENERAL NOTES

- 1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 10-26-07 AND 10-27-07 BY RB&G ENGINEERING, INC..
- 2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
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- 6. BOULDER A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

NOTE: DRILL RIG USED - FRASTE MD-XL

GEOTECHNICAL ENGINEER

BRIDGE SALT LAKE CITY, UTAH SALT LAKE CITY, UTAH STRUCTURES DIVISION CHECOM.

APPROVAL DATE SENOR DESIGN BANK JPN 01/08 CHECK SRJ 01/08 NO

BRF-0191(58)129

RIVER E

COLORADO F

GRAND

COUNTY

F-763

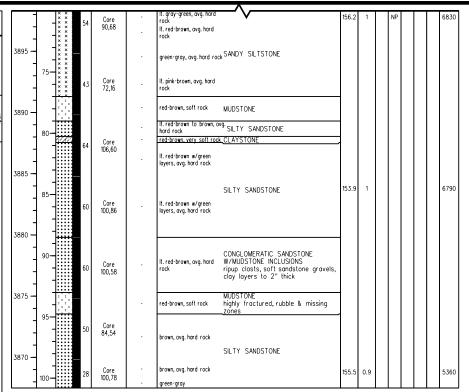
DRG. NO.

sнт. 14 ог 190

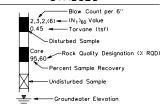
OVER

191

PROJE		10L1 _us-1				ADO RIVE	R BRIDGE		ייטרי	MINO	١N	υ .			3-08 1 of	
CLIENT LOCAT						TRANSPO		PROJECT DATE ST			_	007 1/16	01.2	00		-
DRILLI								DATE CO				1/17,				-
DRILLE					. HARTLI			GROUND					68.3			-
DEPTH	1 10	WATE	.ĸ -	INITI	AL: ∑ _ Sample	14.0	AFTER 24 HOURS: ▼ 14.0'	LOGGED		<u>M. F</u>	Att			datio	n T	-
Elev. (ft)	Depti (ft)	Lithology	Type	Rec. (in)	See Legend	USCS (AASHTO)	Material Description		Dry Density (pcf)	Moisture Content (%)	Liquid Limit	Plast. Index	Gravel (%)	Sand (%)	Silt/Clay (%)	(isd)
-				6 1,	1,2,2,(9)	SM	brown, slightly moist, loose				1				03	
3965 -	5-			6 2	2,1,3,(9)	SM	brown, slightly moist, very loose SILTY SAND									
- -				16 2,	,5,5,(21) 0.85	SM	organics near surface, 3" cla brown, slightly moist, loose at 6'	y layer								
3960 — - -	10-			17 3	5,2,2,(7)	SM (A-2-4(0))	brown, moist, very loose			13.6		NP	0	67	33	
- - 8955 -				4 0/	/15",1,(1)	ML	brown, wet, very loose									
_ - -	15-			10 0/12	2",1/12",(1) 0.08	ML	SANDY SILT clay lenses & layers brown, wet, very loose									
- 																
-	20-				,8,47/5" 0.42	CL-ML -	brown, wet, firm SANDY SILTY CLAY red-brown SILTSTONE									
8945 — - -	25-			50	Core 100,95	-	red-brown, soft rock		139.7	2.1		NΡ			89	30
- - 8940 		-			Core 93,28	-	red-brown, soft rock		155.7	2.1						30
- -	30-				Core 100,36	-	red-brown, soft rock green gray								58	30
- 8935 - -		-				-	red-brown, soft rock SILTY SANDSTONE some clay in matrix, crumble handled, weathered, some ver zones, cross-bedding	s when y soft							68	40
- -	35-	-			Core 100,87	-	red-brown, soft rock to avg. hard rock		153.7	1		ΝP			81	50
3930 - - -	40-	-			Core	÷	interbedded gray & brown, avg. hard rock									
- - 3925 —		* * * * * * * * *		58	96,74	-	It. gray, avg. hard rock SANDY SILTSTONE									
-	45-	× × × × × × × × × × × × × × × × × × ×			Core 94,48	-	black oxide staining, rusty st It. gray, avg. hard rock fractures, few mudstone lens									
- 3920 - -	E^	× × × × × × × × × × × × × × × × × × ×				ML (A-4(0))	purple-gray, avg. hard rockSILTSTONE & SANDSTONE red-brown, very soft rock SILTY MUDSTONE		127.5	6.2	20	2	0	33	67 78	30
-	50-	* *		47	Core 78,46	-	It. green, avg. hard rock SILTSTONE red-brown, avg. hard rock SILTY SANDSTONE									
3915 - - -	55-			48	Core	-	red-brown, avg. hard rock red-brown CLAYSTONE missing zones									
- 3910 -		× × × × × × × × × × × × × × × × × × ×		10	80,44	-	green-gray, avg. hard rock purple-brown to It. red-brown									
-	60-	× × × × × × × × × × × × × × × × × × ×		60	Core 100,82	-	green SANDY SILTSTONE II. red-brown, ovg. hard rock		156	0.9					10,	390
- 8905 - -	65-	***				- -	red-brown, avg. hard rock CONGLOMERATIC SANDSTONE W. MUDSTONE & SILTSTONE rock									
- - -	00-			60	Core 100,86		SILTY SANDSTONE clay seam at 65'									
3900 —	١ '	1::::				-	lt. red-brown, avg. hard rock			l	l		Ш			



SYMBOLS



RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4 LOOSE N 4-10 MED DENSE N 10-30 DENSE N 30-50 VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2 SOFT N 2-4 MEDIUM STIFF N 4-8 STIFF N 8-15 VERY STIFF N 15-30 HARD N>30

GENERAL NOTES

- 1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 11-16-07 AND 11-17-07 BY RB&G ENGINEERING, INC..
- 2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
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- 4. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY RE CRADIIAL
- 5. COBBLE A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
- 6. BOULDER A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

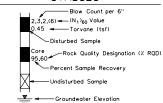
NOTE: DRILL RIG USED - CME-55 NO.1 HAMMER E=0.75

TATIC		DESIGN MNH 11/07 CHECK SR	S Acard	DRAWN JFIN 01/00 CHECK OF	70110	5	
POR		11/07	04/00	01/00			
SANS	ISION	MNH	2	NL		GUANT.	
F F	CIIY, U ES DIV	DESIGN	10000	DRAWN	!	OUANT.	
UTAH DEPARTMENT OF TRANSPORTATIO	SALI LAKE CITY, UTAH STRUCTURES DIVISION		SENIOR DESIGN ENGR.			UDOT BRIDGE ENGR.	
M E			DATE			DATE	
5		APPROVAL RECOMM.	l	UEMORIDA	FOR USE	BYUDOT	
US-191;	OVER COLORADO RIVER BRIDGE	SOIL DATA SHEET			PROJECT BRF-0191(58)129		
	GR	ANE)			_	
_	F-	-76 g. no	3			_	
SHT.	15	0	F1	90)		

CLIENT	CT:		L(1; 0V	ER COLOR	ADO RIVE	R BRIDGE]	30F	SING	N			-SE 1 1:			3910 —		× × × × × × × × × × × × × × × × × × ×				F
LOCAT	Γ: <u>U</u>	TAH DE	PAR	TMENT OF	TRANSPO	ORTATION		PROJECT				007	01.2		J1		-		× × × × × ×	31	Core 93,78	-	r
						06, 56' RT. / N:201,38 . CASING & H.Q. CORE		DATE STA			_	1/13/ 1/16/				-	_	-	× × × × × × × ×				
DRILLE	R:	D. SAMI	2501	l .				GROUND	ELEV	'ATIO	N:	39	80.7				3905 —	75-	× × × × × × × ×	29	Core 96,62	-	r
DEPTH	T0	WATER	- IN	NTIAL: ♀_ Sample	23.3'	AFTER 24 HOU	JRS: ¥ <u>N.M.</u>	LOGGED			Att	EN.		ONE Idatio	n T	_	-	-	× × =		Core		
Elev. (ft)	Depth (ft)	Lithology	Rec. (in)	See Legend	USCS (AASHTO)		erial Description		Dry Density (pcf)	Moisture Content (7)		_		0		Strength (psi)	-	80-	× × × × × × × × × × × × × × × × × × ×	20	68,24	-	r
980 —	-		9	9,22,19,(87)	SM	red-brown, slightly moist, dense	SILTY SAND				1	ш.			S		3900 —	-	× × × × × × × × × × × × × × × × × × ×	60	Core 100,54	-	r
-	- 5-		7	12,16,10,(55)	GC (A-2-4(0))	red-brown, slightly moist, c med. dense p	CLAYEY GRAVEL W/SAND possible cobbles & boulders			9.8	25	10	38	28	34		3895 —	85-	* * * * * * * * *			-	r
975 - - -	- -		8	5,11,14,(51)	SM	red-brown, slightly moist, med. dense											-	-	× × × × × × × × × ×	60	Core 100,53	-	b
970 —	10-		9	4,6,5,(19)	SM	red-brown, moist, med. dense	SILTY SAND										3890 —	90-	× × × × × × × × × × ×	60	Core 100,50	-	b
-	- -		11	9,8,8,(24)	SM	red-brown & gray-brown, smoist, med. dense	SILTY SAND clayey sand lenses										-		× × × × × × × × × ×				
965 -	15-		13	4,5,5,(13)	ML (A-4(0))	green-brown, very moist, loose				19.9	24	3	0	29	71		3885 — -	95-	× × × × × × × × × × × × × × ×	60	Core 100,58	-	g
- 960 -	20-		15	3,3,2,(6)	ML	s	SANDY SILT sandy clay layers, large bouk 22.5'	der at										100		24	Core 100,45	-	C
955 — - 955 — -	25— -		5	4,8,5,(14)	SM	brown, wet, med. dense	SILTY SAND W/GRAVEL																
- - 950 - -	30— -		6	8,6,6,(12)	GP-GM	brown, wet, very loose	GRAVEL W/SILT & SAND																
- 945 — - -	35— - -		4 34	56/4" Core 80,46	- CL (A-4(8))		CLAYSTONE green staining on fractures, s	slaking	150	5.5	27	9	0	1	99								
- 940 —	40- 40-							- 1							- 1								
	-	A A	44	Core	-	red-brown, soft rock	I AYEY BRECCIA									3020							
-	1 -	× × 1	44	Core 74,28	-	red-brown, ex. soft rock b	CLAYEY BRECCIA proken/rubble zone		400														
- - 935 — -	45— -	× × × × × × × × × × × × × × × × × × ×	12	Core 74,28 Core 22,0		red-brown, ex. soft rock b	CLAYEY BRECCIA oroken/rubble zone		160	1.4						3020 4520							
- - -	45— - - - 50—	× × × × × × × × × × × × × × × × × × ×		Core		red-brown, ex. soft rock It. red-brown, avg. hard rock red-brown, avg. hard rock red-brown, avg. hard rock	SANDY SILTSTONE SILTY CLAYSTONE		160	1.4													
- - -	45	××××××××××××××××××××××××××××××××××××××		Core 22,0 Core	- - - CL-ML (A-4(3))	red-brown, ex. soft rock It. red-brown, avg. hard rock red-brown, avg. hard rock red-brown, avg. hard rock	SANDY SILTSTONE		160	1.4	21	6	0	11 :		4520							
930 -	45— 	**************************************		Core 22,0 Core 0,0	- - - CL-ML (A-4(3))	red-brown, ex. soft rock It. red-brown, avg. hard rock red-brown, avg. hard rock no recovery red-brown, avg. hard rock red-brown, avg. hard rock	SANDY SILTSTONE SILTY CLAYSTONE mudstone layers				21	6	0	11		4520							
930 -	55-	**************************************	12 0 17 19 25	Core 22,0 Core 0.0 Core 56,26 Core 64,16 Core 84,0	(A-4(3))	red-brown, avg. hard rock It. red-brown, avg. hard rock red-brown, avg. hard rock no recovery red-brown, avg. hard rock red-brown, soft rock red-brown, soft rock	SANDY SILTSTONE SILTY CLAYSTONE				21	6	0	11 3		4520							
930 —	45— 	× × × × × × × × × × × × × × × × × × ×	12 0 17 19 19	Core 22.0 Core 0.0 Core 56,26 Core 64,16 Core 84.0 Core 60,0	(A-4(3))	red-brown, avg. hard rock It. red-brown, avg. hard rock red-brown, avg. hard rock no recovery red-brown, avg. hard rock red-brown, soft rock red-brown, soft rock red-brown, soft rock	SANDY SILTSTONE SILTY CLAYSTONE mudstone layers SILTY MUDSTONE				21	6	0	11 .		4520							
935 — 930 — 920 — 920 — 93915 — 93915	55-	**************************************	12 0 17 19 25	Core 22,0 Core 0,0 Core 56,26 Core 64,16 Core 84,0 Core 60,0	(A-4(3))	red-brown, avg. hard rock It. red-brown, avg. hard rock red-brown, avg. hard rock no recovery red-brown, avg. hard rock red-brown, soft rock red-brown, soft rock red-brown, soft rock red-brown, soft rock	SANDY SILTSTONE SILTY CLAYSTONE mudstone layers SILTY MUDSTONE			1.6	21	6	0	11 :	89	4520							

		_					_	_	 _	
3910 -	- × × × × × × × × × × × × × × × × × × ×					159.6	1.2			8360
-		31	Core 93,78	-	red-brown, avg. hard rock					
3905 -	75	29	Core 96,62	-	red-brown, avg. hard rock					
-		20	Core 68,24	-	red-brown, avg. hard rock SANDY SILTSTONE clayey mudstone layer at 75'					
3900 -	80	60	Core 100,54	-	red-brown, avg. hard rock	154.4	1.6			7910
3895 -	85————————————————————————————————————	60	Core 100,53	-	red-brown, avg. hard rock green-gray CLAYSTONE					
-	× × × × × × × × × × × × × × × × × ×			-	brown w/green-gray layers, avg. hard rock					
3890 -	90	60	Core 100,50	-	brown w/green-gray layers, avg. hard rock SANDY SILTSTONE					
3885 -	95	60	Core 100,58	-	gray, avg. hard rock	151	1.3			2950
	100	24	Core 100,45	-	dk. gray, hard rock DOLOMITIC LIMESTONE mudstone inclusions, vuggy					

SYMBOLS



RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4 LOOSE N 4-10 MED DENSE N 10-30 DENSE N 30-50 VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2 SOFT N 2-4 MEDIUM STIFF N 4-8 STIFF N 8-15 VERY STIFF N 15-30 HARD N>30

GENERAL NOTES

- 1. THE SUBSURFACE EXPLORATION SHOWN
 WAS CONDUCTED BETWEEN 11-13-07
 AND 11-16-07 BY RB&G ENGINEERING,
 INC..
- 2. THESE BORING LOGS REPRESENT A
 SYNOPSIS OF THE SOIL DEPOSITS
 ENCOUNTERED WITHIN EACH BORING AND
 ARE BASED ON SOUND GEOLOGICAL AND
 ENGINEERING JUDGMENT. BECAUSE
 SOIL IS A COMPLEX MEDIUM, THESE
 BORING LOGS MAY OR MAY NOT
 REPRESENT THE SOIL CONDITIONS AT
 THIS SITE. THIS SUBSURFACE
 INTERPRETATION IS PRESENTED IN
 GOOD FAITH AND IS NOT INTENDED AS
 A SUBSTITUTE FOR PERSONAL
 INVESTIGATION AND JUDGEMENT OF
 THE CONTRACTOR.
- 3. THE WATER LEVELS AND CONDITIONS INDICATED ON THE BORING LOGS REPRESENT HOLE CONDITIONS ON THE DATE SHOWN, HOWEVER, IT SHOULD BE NOTED, THAT AT LOCATIONS AWAY FROM THE BORINGS OR AT ANOTHER TIME THE WATER LEVELS AND CONDITIONS MAY VARY SIGNIFICANTLY.
- 4. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
- 5. COBBLE A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
- 6. BOULDER A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

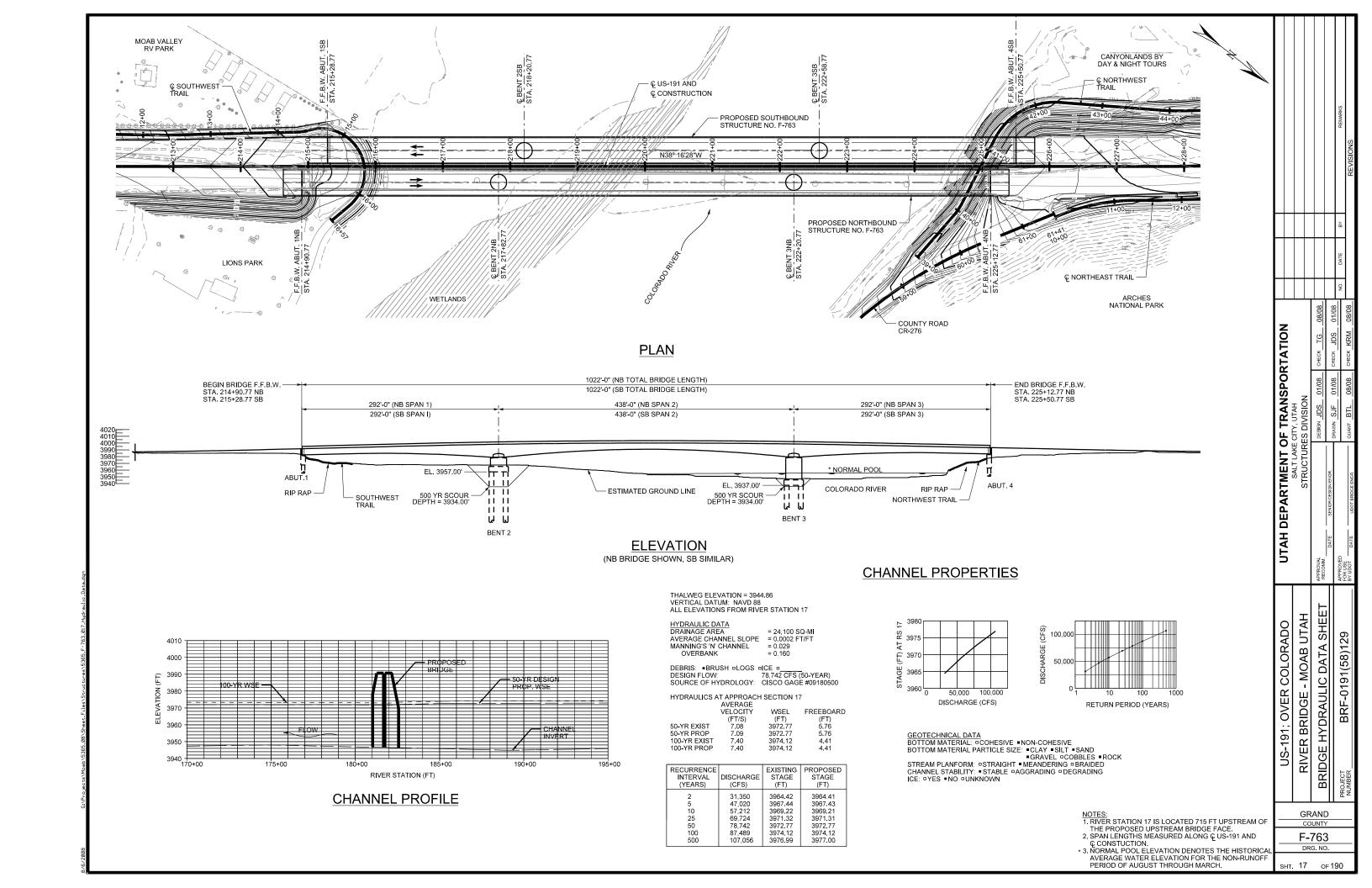
NOTE: DRILL RIG USED - CME-55 NO.1 HAMMER E=0.75

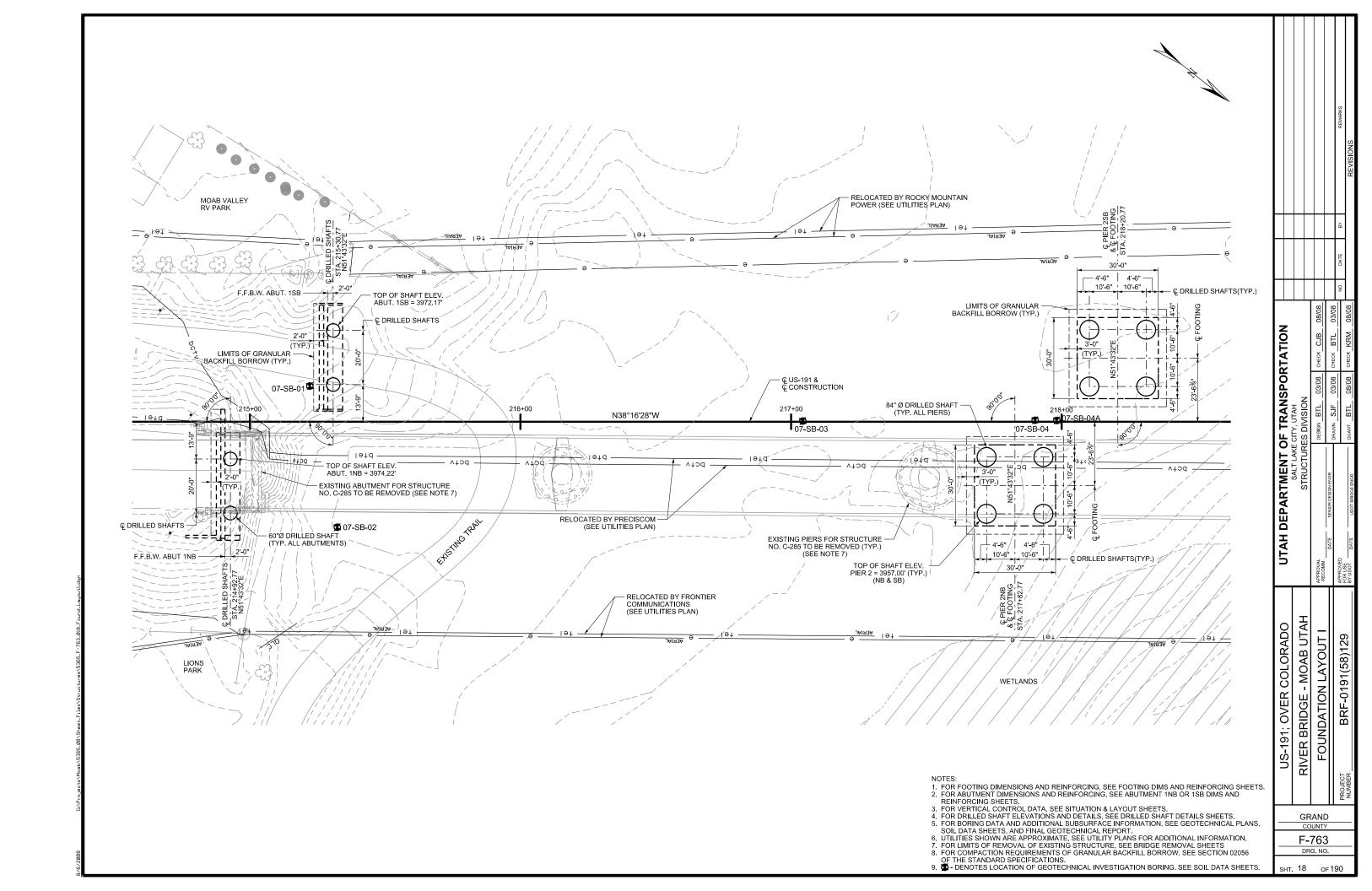
GEOTECHNICAL ENGINEER

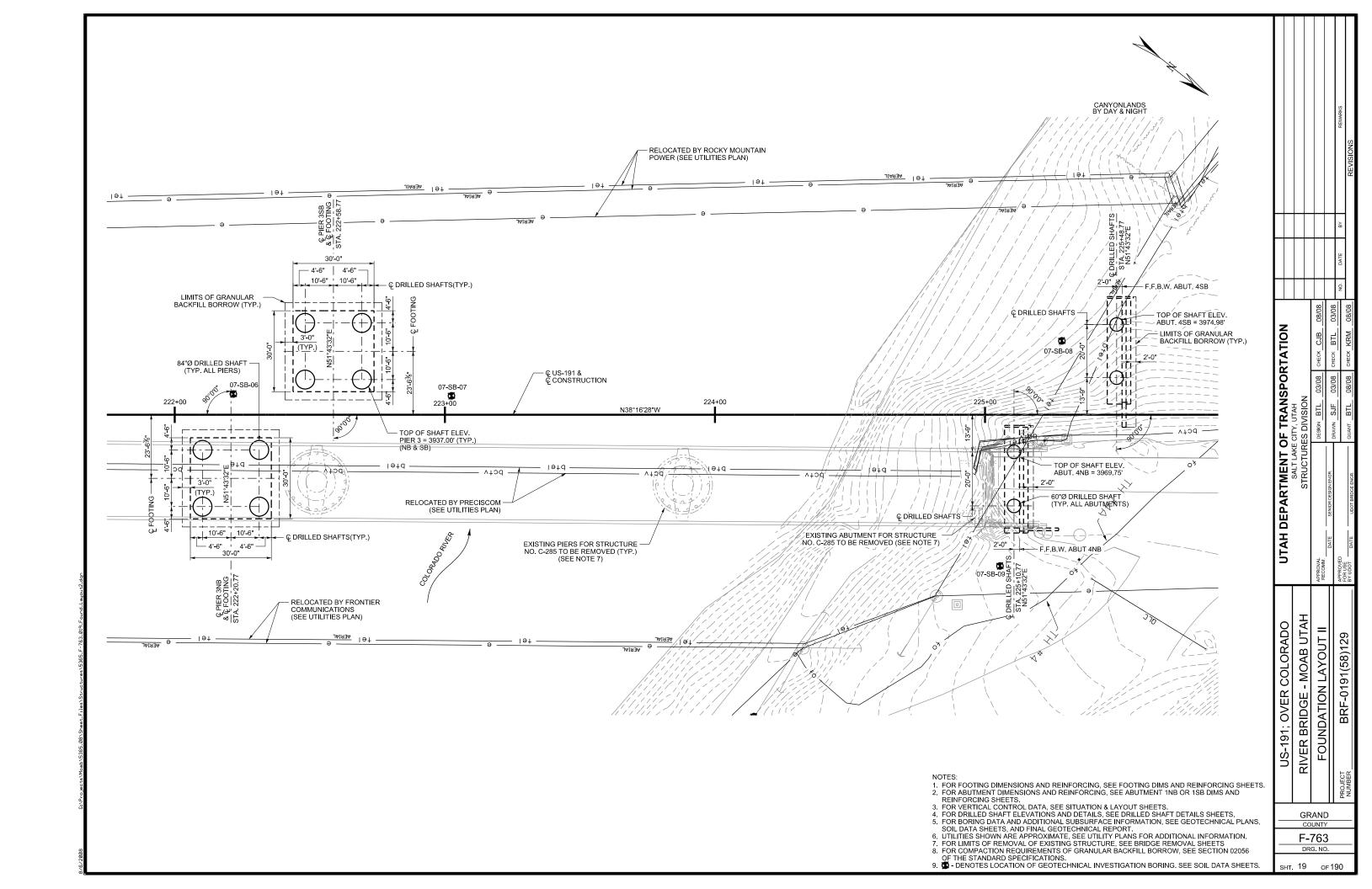
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H.	in, un	ESIGN	10010	HEAVIN		QUANT.	ı
JTAH DEPARTMENT OF TRANSPORT	SALT LAKE CITY, UTAH STRUCTURES DIVISION		DATE SENIOR DESIGN ENGR.			DATE UDOT BRIDGE ENGR.	
-		APPROVAL RECOMM.		APPROVED	FOR USE	BY UDOT	
US-191;	OVER COLORADO RIVER BRIDGE	SOIL DATA SHEET			PROJECT BRF-0191(58)129		
	GR	ANE)				
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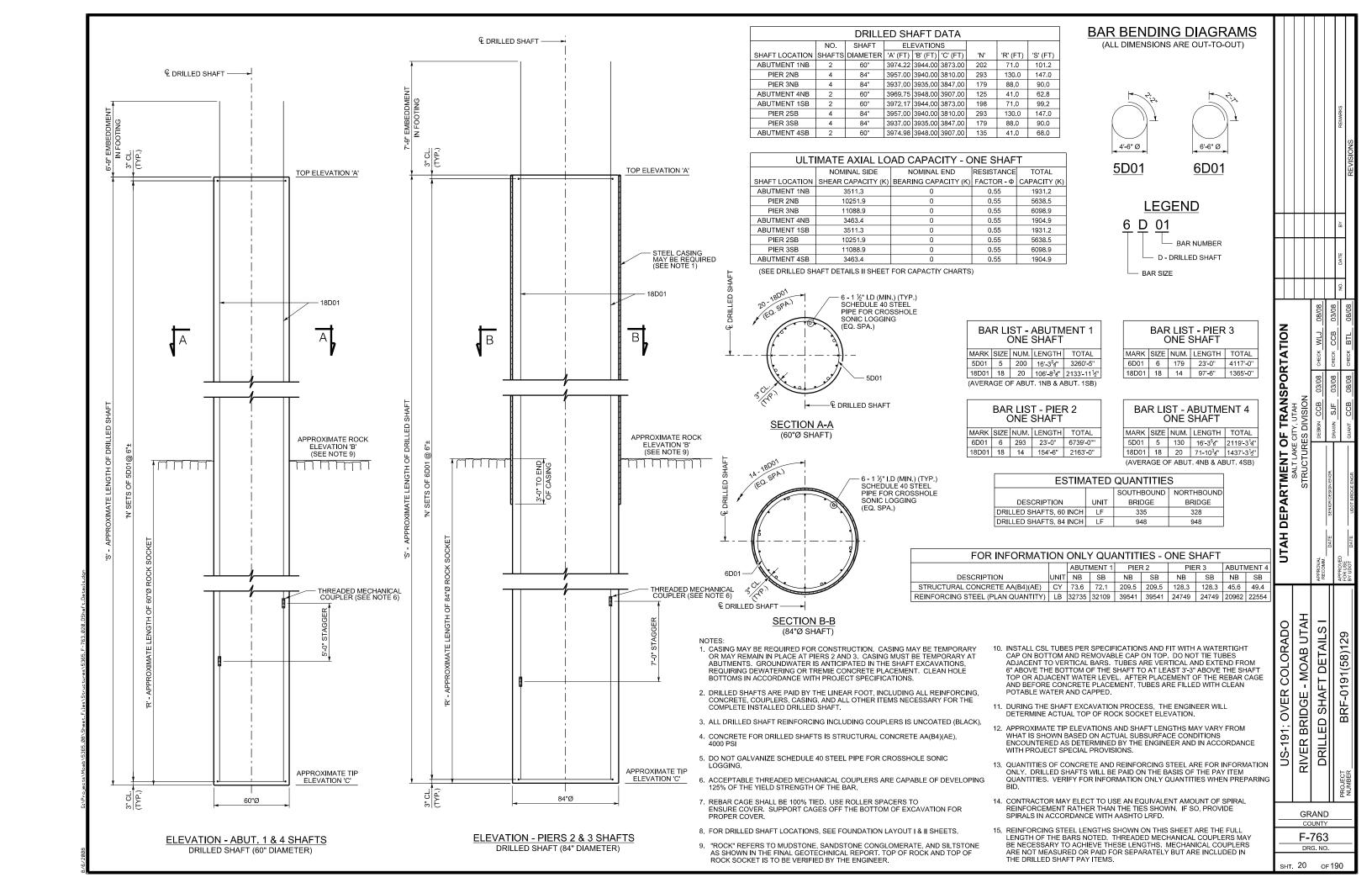
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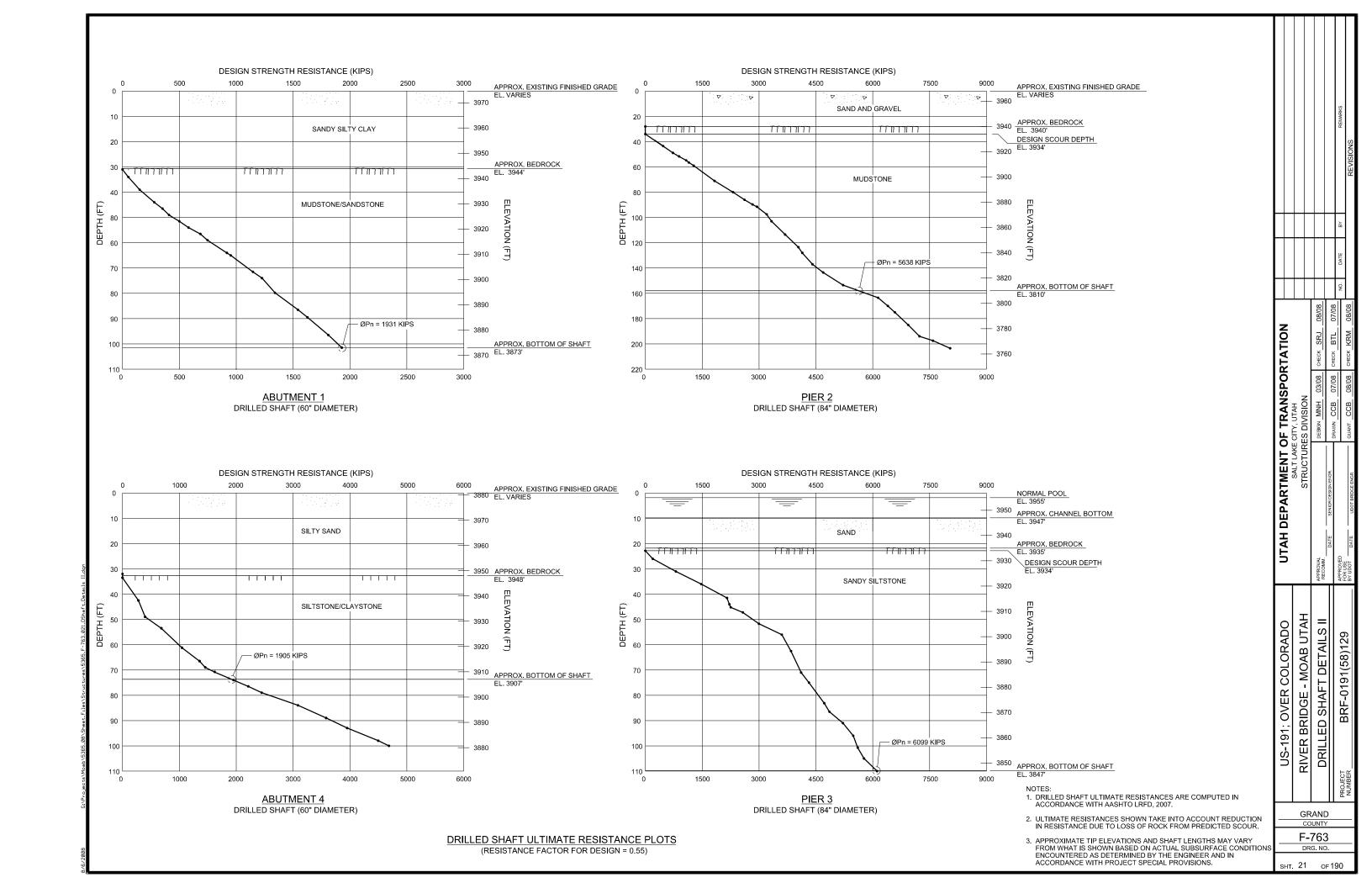
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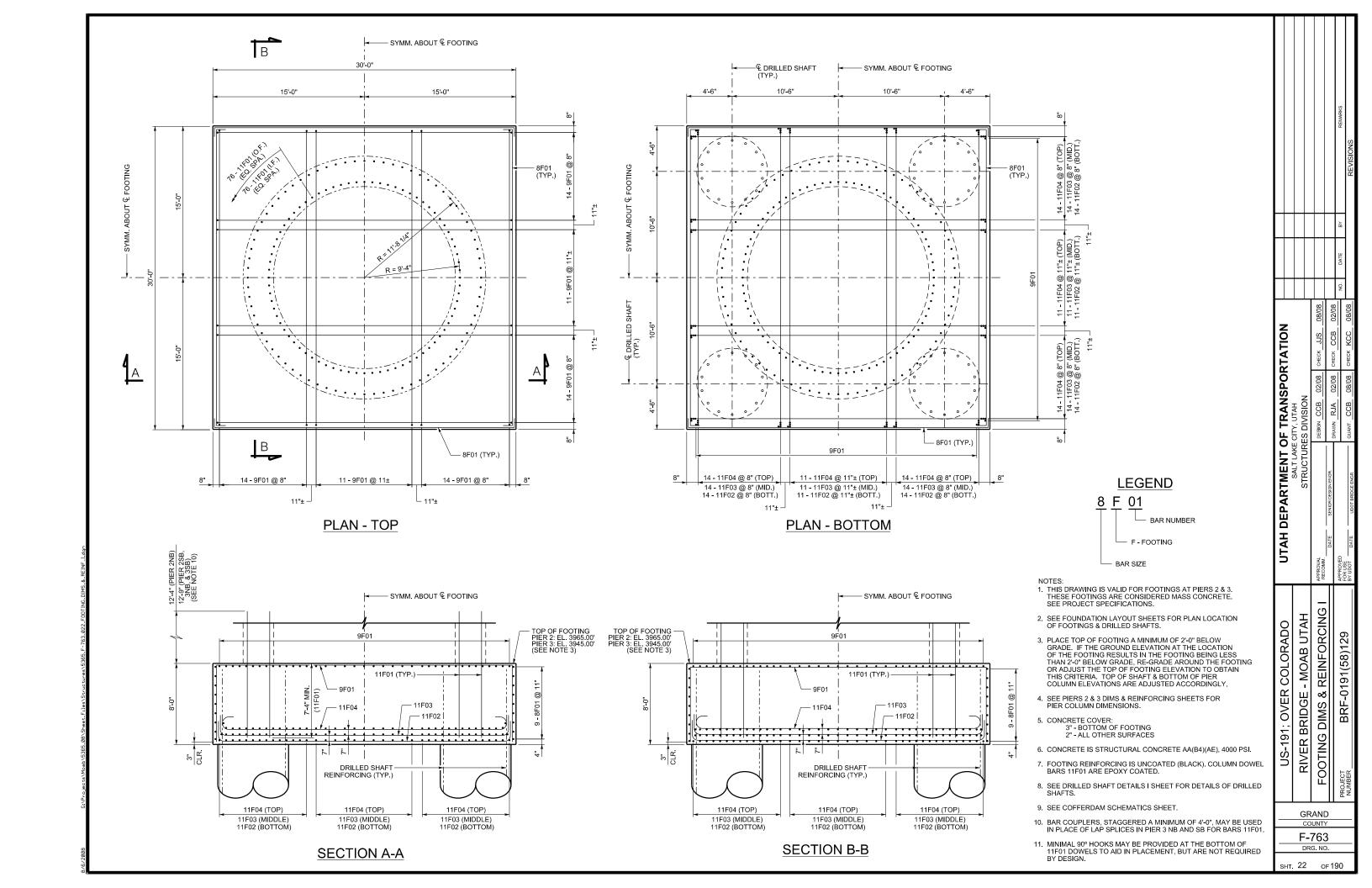








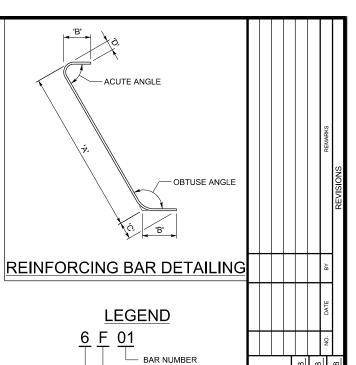




BAR BENDING SCHEDULE - ONE FOOTING

MARK	LOCATION	SIZE	NUM	LENGTH	TOTAL			20'-1"
11F01	FOOTING DOWELS	11	152	20'-1"	3052'-8"			
								
		I			ı		_	
MARK	LOCATION	SIZE	NUM	LENGTH	TOTAL	'A'	'B'	'A'
8F01	FOOTING FACE	8	36	32'-4"	1164'-0"	29'-8"	1'-4"	
9F01	TOP MAT	9	78	44'-5 1/2"	3467'-9"	29'-6"	7'-5 3/4"	
11F02	BOTTOM MAT	11	78	33'-3 1/2"	2596'-9"	29'-3 1/2"	2'-0"	<u> </u>
11F03	BOTTOM MAT	11	78	33'-0 1/2"	2577'-3"	29'-0 1/2"	2'-0"	<u> </u>
								<u>↓</u>
					ı			
MARK	LOCATION	SIZE	NUM	LENGTH	TOTAL			
11F04	BOTTOM MAT	11	78	32'-0"	2496'-0"	Ī		
								(
								001.401
								28'-10" 1'-7"
						_		

ESTIMATED QUANTITIES - ONE FOOTING		
ITEM DESCRIPTION:	UNIT	QUANTITY
REINFORCING STEEL (PLAN QUANTITY)	LB	55,649
REINFORCING STEEL - COATED (PLAN QUANTITY)	LB	16,219
STRUCTURAL CONCRETE AA(B4)(AE) (FOR INFORMATION ONLY)	CY	266.7



NOTES:

1. STRUCTURAL CONCRETE VOLUME GIVEN IS FOR INFORMATION ONLY. STRUCTURAL CONCRETE AA(B4)(AE) IS PAID LUMP SUM.

F-FOOTING

BAR SIZE

- 2. FOOTING REINFORCING IS UNCOATED (BLACK). COLUMN DOWEL BARS 11F01 ARE EPOXY COATED.
- 3. MINIMAL 90° HOOKS MAY BE PROVIDED AT THE BOTTOM OF 11F01 DOWELS TO AID IN PLACEMENT, BUT ARE NOT REQUIRED BY DESIGN.

DRG. NO.

GRAND COUNTY F-763

FOOTING DIMS & REINFORCING II RIVER BRIDGE - MOAB UTAH US-191; OVER COLORADO

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

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